Volume 89 Number 14

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

The Week In Steel

A WEEK has passed since the United States Steel Corp. struck the cloak of immunity from common labor wage rates and subjected them to the scaling-down process long since applied to dividends and salaries, and thus far there has not been "the hell to pay." This incendiary phrase of an assistant secretary of commerce, a confidant of the President, perhaps denotes as much political as economic or social apprehension. Fortunately, it has found lodgment only in the fulminations of a few leaders of organized labor. Steel labor appears mindful that its wage rates remained sacred so long as two years after the collapse of 1929, and newspaper editorial opinion is that prolongation of the depression renders the theory of maintained wages untenable.

Where Steel Sits Is the Head of the Table

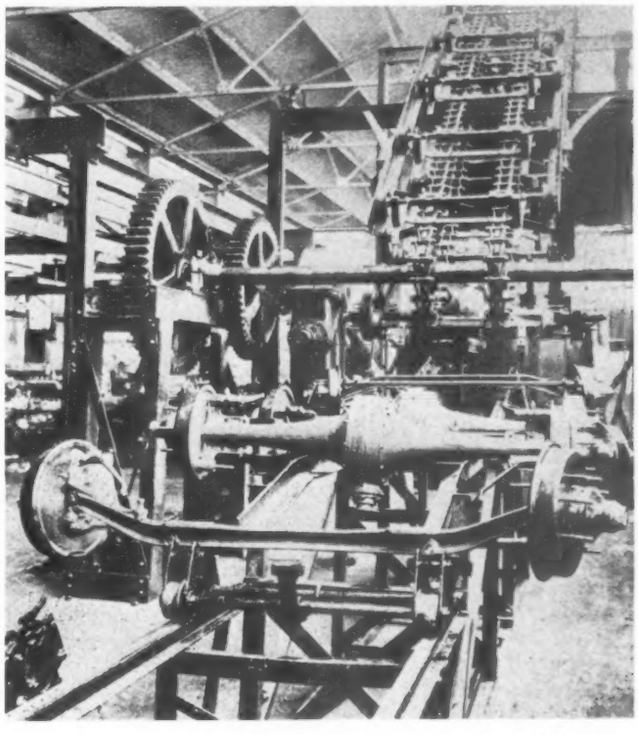
Rarely has a declaration of policy cut across so large a sector of industry. From the Steel corporation's decision other steel producers and other industries have derived the moral courage to order an adjustment (Page 15) which awaited only a propitious borning. For all practical purposes, the Steel corporation's 10 per cent reduction blankets the entire industry. . . . The higher steel rises in the scale of finished products the greater is the saving. In iron ore, 10 per cent off wages means barely 5 cents per ton (Page 15); on the basis of Steel corporation costs, the cumulative saving on a ton of bars or plates would be $2.74 to $3.37, in good operation.

Lag in Adjustment Favors Labor

Whether labor has received a square deal from the steel industry is answered conclusively by a contrast (Page 15) of the trend of wages and steel prices through the war period and since. From 1916 to 1918 and again in 1920 prices outran wages, but since 1922 wages have held their ground tenaciously while prices have been gradually falling away. . . . One producer has reappraised all manual effort, to take full cognizance of changes wrought by mechanization, and has established (Page 15) uniform scales in 22 zones above common labor.

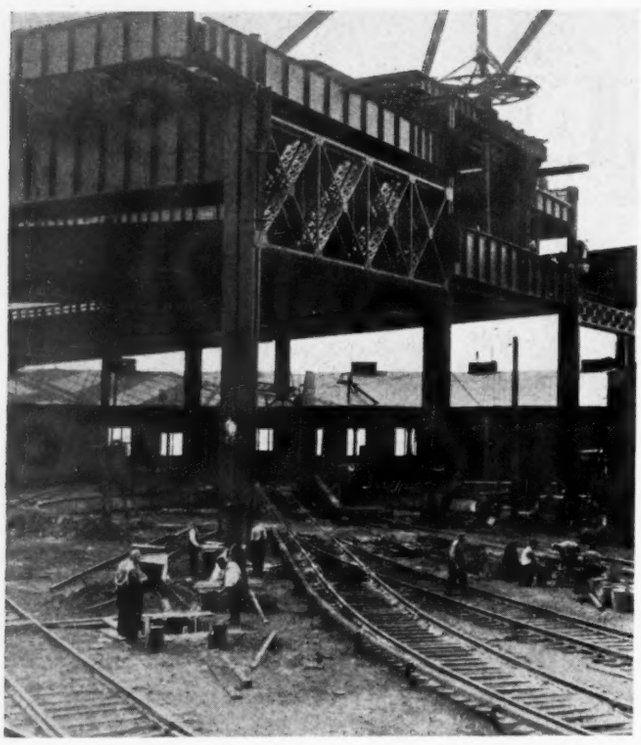
Untouched by Human Hands—Yet

Thus far railroad wage rates have remained secure within the cellophane wrapper fastened around them so adroitly by congress and the railroad brotherhoods, but profane hands are attempting to expose them to the adjustment now in process in all other industries. Although the interstate commerce commission expressly closed the door to testimony on wages in hearings on the railroads' plea for a 15 per



—*Acme Photo*

Assembling "baby" cars by continuous conveyance in Birmingham, Eng. Britain was the first European country to adopt American motorcar production methods. Demand for the small car is booming



Wide World Photo

Steel aids in speeding traffic, relieving congestion: A section of New York's new "express highway"

cent advance in freight rates, the state commissions have injected (Page 19) the issue, contending that wages are inflated and should be surveyed before rates are raised. If railroad labor should refuse to take a cut, the negotiations required by law would consume a year.

Has Price Fever Run Its Course?

Steel producers would like to believe that the 10 per cent wage reduction only compensates them for previous concessions in price, but they have before them the record (Page 16) of 1921. Mild as that depression was—production declined only one year—prices were easy a full year after production turned up. The current depression has harried the industry two years, and September has registered another low in output. . . . This week steelmaking operations are off three points to 29 per cent (Page 65), and the markets are stagnating. . . . Even before the shock of gold standard suspensions, August foreign trade in steel (Page 21) slumped.

Steel and Rubber Grip Hard

When steel and rubber join hands they join, with a grip of 500 pounds to the square inch to provide a new type of pickling tank (Page 31) for which many advantages are claimed. . . . As the airmail flies at night its safety largely rests with tower beacons (Page 50), each of which requires 6 tons of steel, 230 being erected annually. . . . Home canners can "save the surplus" of fruit and vegetable crops without crimping the tin plate industry, as 40,000,000 jars of home-preserved goods would displace (Page 20) less than one-third of 1 per cent of last year's tin plate output.

Coal Prefers To Dig Own Way Out

The President, tireless in his efforts to rescue industry from its economic morass, continues (Page 18) to nurse his stabilization plan for bituminous coal despite the disinclination of operators to meet the administration and mine labor in conference. . . . Western Pennsylvania mine owners typify this attitude, convinced (Page 25) that their difficulties are economic and skeptical of any governmental panacea. . . . Coal's plight the world over is one of inertia, concludes (Page 18) the National Industrial Conference board. In tons, as much coal was produced in 1930 as in 1913, but coal supplied only 72 per cent of the world's energy in 1930 compared with 88 per cent in 1913, due entirely to the strides made by competing fuels.

Depression Unleashes Inventive Minds

New steels, new processes, new equipment shown at the National Metal exposition in Boston disclose (Pages 38, 39) how depression has shifted emphasis from production to research. . . . At this exposition 51,262 were in attendance (Page 17) despite the times, while at the accompanying National Metal congress 4149 from the five participating technical societies registered. . . . Technical marvels (Pages 41, 42, 45) at the congress included newly designed heating furnaces to revolutionize forging methods, a combination of chromium and nickel in cast iron to produce a superior iron for cylinder blocks, manufacture of wire mesh as wide as 102 inches on automatic electric welding machines.

Where Age Does Not Fully Gage Service

Necessity has indeed proved the mother of invention in machine tools. Reviewing the trend in design, an editor in opening a university lecture course stresses (Page 20) the modern origin of today's important equipment, recounts that advances registered in the past year exceed those of any previous five years, and foresees higher speeds, elimination of nonproductive time, and a maximum of operating conveniences. . . . Labor's historical attitude toward machinery is that it is an ogre, a job snatcher, yet an unbiased verdict (Page 56) is that the trend toward mechanization is only the sequel to the yearning for a higher standard of living, actual changes have come slowly, and what has been castigated as technological unemployment is in reality technological readjustment.

Wage Cuts General; American Co. Adopts Zone System

WHILE the steel industry this week was completing its plans for a sweeping reduction in wages, uniformly 10 per cent, effective Thursday, the American Rolling Mill Co., Middletown, O., announced the adoption of "a wage equalization plan," to go in effect Oct. 4.

The company's new system is said to have resulted from two years' scientific study of wages in the steel industry, with full recognition of radical changes introduced by modern equipment. It establishes uniform scales in 22 zones above common labor, applicable in all the company's plants.

Rates evolved from the studies resulted in a net reduction of 4.6 per cent, but upon the announcement by other leading steel companies of a 10 per cent cut, an additional reduction of 5.4 per cent was applied, horizontally. Common labor will receive $3.60 for ten hours' work. Job "reappraisals" are stated to give equitable consideration to the degree of skill required for each, with due thought for responsibility in the handling of equipment and products.

To Pass Savings On?

Though "hell to pay" has not followed the general wage reductions, as predicted by William Green, president, American Federation of Labor, and Julius Klein, department of commerce, at least not so far as protests from labor are concerned, some steel producers have become convinced that a portion of the saving will have to be passed along to buyers—and in that they see delay, interruptions and difficulties.

Labor costs will be reduced in practically all departments of the iron and steel industry, as a result of the cut in wages. Naturally, the saving will be less of a factor in the production of raw materials than in finished steel. For example, the average wage cost of mining a ton of Lake Superior iron ore is approximately 50 cents; the saving here will be only 5 cents a ton.

Furnace Saving Is Small

The labor cost involved in blast furnace operations ranges from 35 cents to 70 cents a ton of pig iron, with 55 to 60 cents a ton the most general average. Unless blast furnaces are able to procure their raw materials cheaper, their saving solely as a result of the wage cut in their department will be only 5 to 6 cents a ton.

Labor costs at a typical Ohio steel plant now range from 70 cents to $1 a ton in the open-hearth department; 40 to 60 cents a ton in the blooming mills, and 30 to 60 cents in the sheet bar department. It is in the finished steel departments where the labor expense is the highest, and varies the most widely, not only as regards products but also among producers.

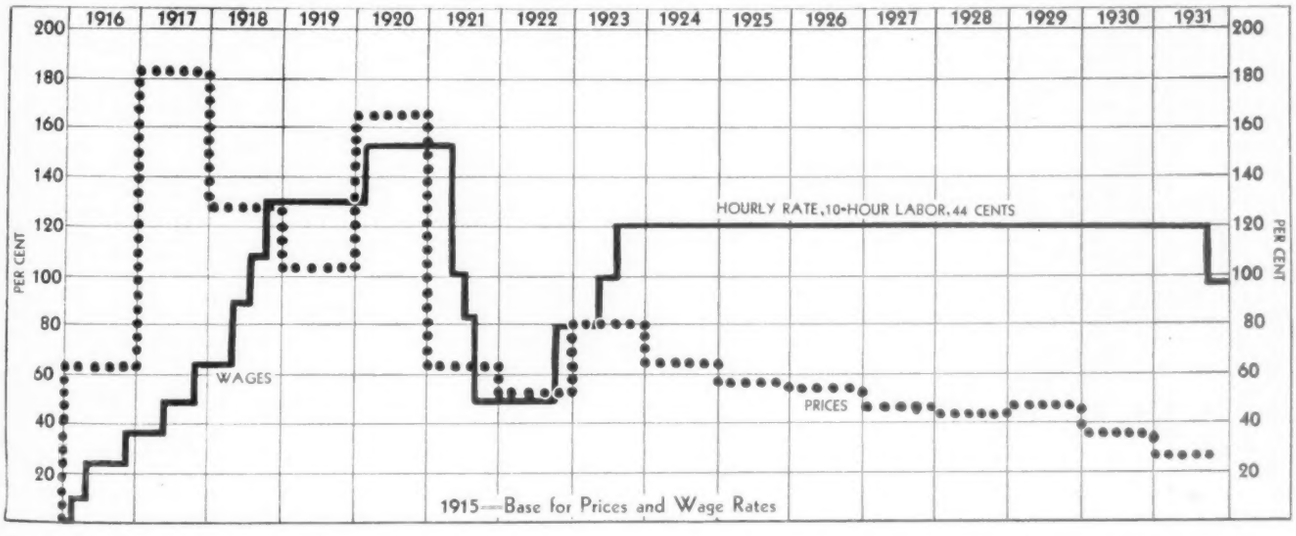
The cumulative savings, from ore to finished materials, are difficult to estimate. These probably are reflected more accurately in the case of the United States Steel Corp., which sells neither ore, coke, pig iron nor semifinished material, than by considering each department of the industry separately.

The total wage and salary outlay for the Corporation in 1930 was equivalent to $33.70 per ton of finished steel manufactured for sale. This item was $27.45 in 1922, when operations were steadier. With a wage reduction of 10 per cent, and salary cut of 10 to 15 per cent, the saving in the wage and salary bill per ton of finished steel for sale, may range from $2.74 to $3.37. The total wage and salary outlay for the Corporation in 1930 was $391,271,366.

Nearly all iron and steel manufacturers have now followed the lead of the United States Steel Corp., Bethlehem Steel Corp., and Youngstown Sheet & Tube Co., in cutting wages 10 per cent, and others are expected to do so by Oct. 1 or shortly thereafter. Among companies which have announced reductions are Jones & Laughlin Steel Corp., American Rolling Mill Co., Colorado Fuel & Iron Co., Otis Steel Co., Corrigan, McKinney Steel Co., Gulf States Steel Co., Pittsburgh Steel Co., Pittsburgh Crucible Steel Co., National Steel Corp., Alan Wood Steel Co., Inland Steel Co., and Republic Steel Corp. The latter announced its new rates will be 45 cents for 8-hour labor; 40 cents for 10-hour, and 36 cents for 12 hour.

Other Industries Follow

Wage cutting in the steel industry spread quickly to other industries, notably copper and rubber. While railroad labor has not been directly affected, several more lines have reduced salaries. Other companies which have readjusted wages or salaries in the past week are General Motors Corp., with reduction of 10 to 20 per cent for all employes; General



Steel and iron prices, as represented by STEEL'S *composite, stepped up more rapidly than did the United States Steel Corp.'s common labor wage rates in the years immediately following* 1915. *Since* 1923, *the wage rates have held up while prices have moved down—tending to neutralize the two factors*

Refractories Co., United States Gypsum Co., Pittsburgh Coal Co., Nicholson File Co., Stewart-Warner Speedometer Corp., and Aluminum Co. of America.

Wage reductions in iron and steel manufacture, as reported to the bureau of labor statistics since 1929 and up to Oct. 1, affected in all approximately 50,000 workers. When the industry finally determined its course, the wages of 500,000 were cut within one week.

The first effect this will have on the rank and file of steel wage earners is traceable through additional reports to the bureau. In July, companies employing 200,000 showed actual weekly per capita wages paid amounted to $20.62, and this figure was 21.6 per cent less than paid by

(*Concluded on Page* 69)

Steel Prices and Output Repeating Order of 1921?

CAN any conclusions be drawn from the steel industry's experiences in the 1921 depression such as would shed light on the present situation, or give a basis for founding expectations as regards development in the near future?

Comparisons between certain factors ten years ago and today may be significant. In the steel industry these tend to strengthen the opinion gained from many years' observation that steelmaking operations must make a definite turn upward before prices can be expected to do so.

Ten years ago the duration of the depression in steel production was about one year. With 1920 considered as 100, output in 1921 dropped to 47. It rallied to 85 in 1922, and in 1923 was 106.7.

However, it took two years for prices to reach bottom. Again with 1920 as 100, the level of prices in 1921 was 62, and in 1922 it was 57.7 The downward movement was not only slower than that in production, but the recovery was less buoyant.

The outstanding points regarding steel's depression ten years ago were that it took only one year for production to reach bottom, and two years for the deflation of prices.

In the present period, production has moved downward over a stretch of two years; and prices, also. With 1929 considered as 100, output in 1930 was at 72; and for the first eight months this year, at 52. With 1929 as 100, prices in 1930 were at 91; and for the eight months this year, at 86.

Assuming that production has reached the low point for the present period in 1931, if the experience of 1921 is repeated prices will continue to fall to a lower index during 1932 than they did for 1931.

The probability of a repetition of this experience, however, must be considered in the light of actual prices, then and now. The rebound this time may not be so long delayed because the profit possibility undoubtedly is less. The effect of wage reductions on prices is not yet clear.

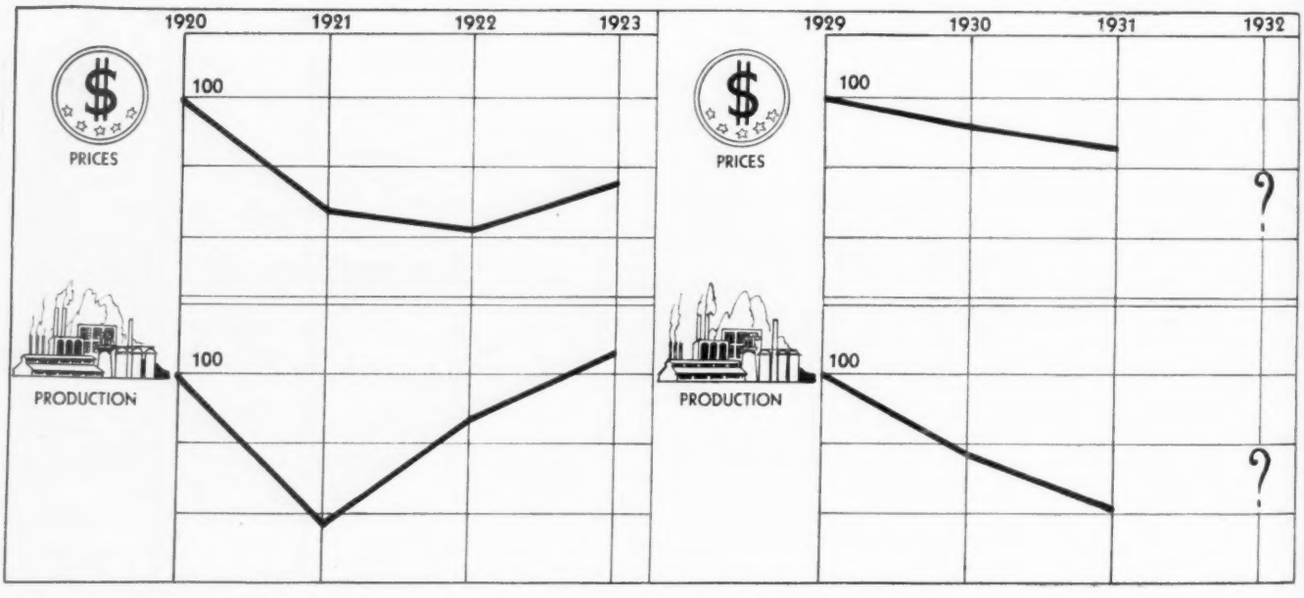
STEEL'S composite of 14 leading iron and steel products for 1920—the year before the depression—was $65.59. The composite for 1929—again, just before the depression—was $36.48. Ten years ago prices had much farther to go to be "deflated." Before the slide in 1921 and 1922 was stopped $27.73 was taken off the $65.59—1920 composite. It was down to $37.86 before recovery set in.

Prices Already Deflated

The price composite in 1929—the year of great, general prosperity—was actually $1.38 below the "deflated" $37.86 price of 1922. And since 1929, $5.10 has been taken off, as the composite for the first eight months this year stood at $31.38.

If prices lack the upward pull, such as would be imparted by an ascending production trend, they also are freed for the present from a destructive influence, in that production manifestly is unprofitable.

The accompanying chart exhibits the price and production factors for the two periods. The indexes for prices are computed from STEEL'S composite, while those for production represent average daily output of steel ingots for the respective years. For the comparison ten years ago, the price and production levels as of 1920 are taken as base, and for today's comparisons, the levels as of 1929.



In the depression of 1921 *the rate of steel ingot production reached bottom within the year, while iron and steel prices fell off for two years. In the present period production has descended for nearly two years—and prices also, although again more slowly than production*

Five Societies Convene in Boston Metal Congress

ALTHOUGH depressed business conditions in industry were reflected in the attendance at the Thirteenth National Metal congress and exposition in Boston, Sept. 21-25, the shrinkage was less than had been expected. According to official figures, the registration of members of the five cooperating technical societies totaled 4149 while the show attendance was 51,262.

Participating in the metal congress program were the American Society for Steel Treating, American Welding society, iron and steel and institute of metals divisions of the American Institute of Mining and Metallurgical Engineers, iron and steel and machine shop practice divisions of the American Society of Mechanical Engineers and the iron and steel division, standards committee, Society of Automotive Engineers.

The Steel Treaters conducted ten technical sessions, the Welding society seven, Mining and Metallurgical engineers six, Mechanical Engineers two and Automotive Engineers one. Principal topics at the sessions, some of which were arranged jointly were: Sheet steel, stainless alloys, steel melting, age hardening and structural steel welding.

Social events of the five-day program were a dinner of the Mining and Metallurgical Engineers on Sept. 23, and dinners of the Steel Treaters and Welding society on Sept. 24.

The congress was the occasion of the annual meeting of the American Society for Steel Treating, consequently some of the events which took place are of general as well as society interest.

Officers Are Nominated

A. H. d'Arcambal, sales manager of small tools, Pratt & Whitney Co., Hartford, Conn., was nominated president of the society for 1932. For the office of vice president, W. B. Coleman, president, W. B. Coleman Co., Philadelphia, was nominated. These and other nominations were announced on Page 19 of the Sept. 24 issue of STEEL. Nomination virtually assures election and the offices will be assumed Jan. 1, 1932.

Announcement was made that Baltimore members of the Washington-Baltimore chapter have been authorized to establish a group, which later may be reconstituted as a chapter. At the same time, the York group was advanced to chapter rating.

Presentation of the R. M. Bird bell and gavel, awarded annually to the chapter making the most notable progress in the opinion of the directors, was made to the Hartford chapter for its initiative in arranging the New England sectional meeting last April.

A. H. d'Arcambal

Nominated for president of American Society for Steel Treating

At the banquet of the society, the Henry Marion Howe gold medal, awarded annually for the best technical paper published in *Transactions*, was presented jointly to K. Heindlhofer and E. C. Bain, staff of research laboratory, United States Steel Corp., Kearny, N. J.

The prize-winning paper, "A Study of the Grain Structure of Martensite," was presented at the semiannual meeting in New York, Feb. 7-8, 1930, and published in the July-December, 1930, *Transactions*. This paper presented data relating to crystalline structure of martensite by X-ray diffraction and petrographic microscope.

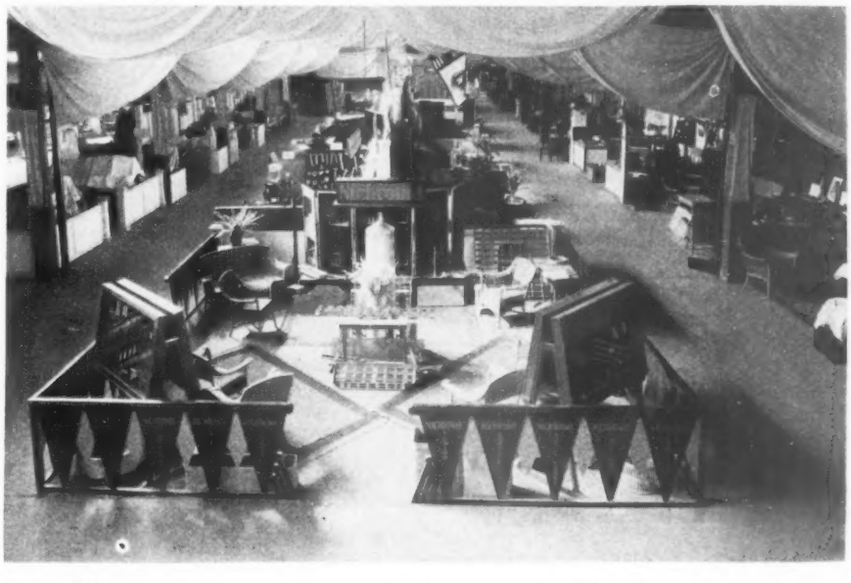
Robert G. Guthrie, chief metallurgist, Peoples Gas Light & Coke Co., Chicago, was presented with the Past President's medal in recognition of his services as president of the society in 1930.

No announcement as to the place or date of the 1932 congress and exposition will be made until after the January meeting of the board of directors, although it is definitely understood that the congress and show will be held.

Discusses Nonmetallic Inclusions

In delivering the annual Campbell memorial lecture of the American Society for Steel Treating, Dr. C. H. Herty Jr., supervising chemist in charge of the metallurgical section, bureau of mines experiment station, Pittsburgh, masterfully discussed the subject of nonmetallic inclusions in steel. Through research work, the speaker has become the country's leading authority on this subject.

Dr. Herty discussed the types of nonmetallic inclusions, their source, deoxidation of steel and effect of inclusions on physical properties. There is evidence, he said, that physical properties, fatigue and corrosion resistance are little affected by the total number of inclusions; size of inclusions seem of more importance.



Some 150 manufacturers displayed equipment in the 1931 National Metal exposition in Boston

That the steelmaker can produce cleaner steel, he made a plea for the consumer to give more freedom in specifications.

The science lecture of the American Institute of Mining and Metallurgical Engineers attracted the largest audience. This lecture, "Recently Discovered Complexities in the Properties of Simple Substances," was delivered by Dr. P. W. Bridgman, Hollis professor of mathematics and natural philosophy, Harvard university, Cambridge, Mass.

Some time ago the institute conceived a plan for a series of lectures by leading scientists in the country and Dr. Bridgman was the first to appear on this program.

Merger Hearing Oct. 26; Contract Reported Renewed

Youngstown, O.—The merger contract betwen Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. has been renewed, according to Newton D. Baker, chief counsel for Sheet & Tube, in court of appeals here Sept. 28. Hearing of the appeal from the decision by the court of common pleas enjoining the merger was set for Oct. 26. Mr. Baker argued for further delay, but counsel for minority interests succeeded in having the court schedule the hearing for that day.

Relative Coal Use Off

In 1913 coal produced 88 per cent of the total world energy reduced to terms of equivalent coal, but this ratio declined to 74 per cent in 1929 and 72 per cent in 1930, states the National Industrial Conference board, New York. In contrast, the ratio of oil increased from 6 per cent in 1913 to 17 per cent in 1929 and 19 per cent in 1930. This change results largely from an expansion in world consumption of energy and a stationary position by coal.

E. C. Bain
Awarded Howe medal of American Society for Steel Treating

C. H. Herty Jr.
Campbell memorial lecturer of American Society for Steel Treating

Institute Announces Papers; Elects New Secretary

New York—The American Iron and Steel Institute has announced the titles and authors of five technical papers to be presented at its fall meeting to be held in New York, Oct. 23, as follows:

"Experiments in Speech and Music," by L. S. O'Roark, Bell Telephone Laboratories, New York.

"The Bessemer Process and Its Product," by Prof. R. S. McCaffery, University of Wisconsin, Madison, Wis.

"The Metallic Charge in Basic Open-Hearth Operations," by C. D. King, chairman, open-hearth committee, United States Steel Corp, New York.

"Magnetic Iron and Steel," by Dr. T. D. Yensen, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Factors That Affect the Welding Qualities of Steel," Wilmer E. Stine, research engineer, Lincoln Electric Co., Cleveland.

Howard H. Cook was elected secretary of the institute at a meeting of the directors Sept. 25. Mr. Cook, who succeeds the late E. A. S. Clarke, has served as assistant secretary since 1910 and is well known in the iron and steel industry.

Foundry Club Resumes

A review of high spots of some of the papers presented at the 1931 convention of the American Foundrymen's association, in Chicago, will comprise the program of the season's first meeting of the Chicago Foundrymen's club on Friday, Oct. 8, at the City club, Chicago. Several speakers prominent in the foundry industry will discuss the 1931 convention.

The Business Week In Washington

SUSPENSION of the Sherman anti-trust law as an aid to restoring business was discussed at a conference between the President and Charles F. Abbott, executive director, American Institute of Steel Construction. Other White House news of the week:

The President continues to confer with representatives of the bituminous coal industry in regard to stabilizing the industry.

The President has called upon all organizations to refrain from seeking any but urgent appropriations from the next congress.

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Most favored nation tariff agreements have been entered into between Brazil and France, England and the Netherlands.

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An increase in the postage rates on both letters and postal cards will become effective, Nov. 1, to 35 countries, according to the post office department.

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Senator Reed of Pennsylvania, member of the senate finance committee, has stated that he believes that some tax legislation will be necessary at the next session of congress.

□ □ □

Volume of industrial production and

K. Heindlhofer
Awarded Howe medal of American Society for Steel Treating

factory employment, which usually increases at this season, showed little change from July to August, and the federal reserve board's seasonally adjusted indexes declined consequently.

Profitless Bids Condemned By Reinforcing Bar Head

"More clear thinking, elimination of self-satisfaction, developing possibilities of our fellow-employes, better competitive co-ordination and developing new business possibilities"—these are steps necessary for the reinforcing bar industry, declared O. W. Irwin, president of the Concrete Reinforcing Steel institute, in opening the institute's semiannual convention at Shawnee-on-Delaware, Sept. 28.

Mr. Irwin scored the vacillating attitude of the federal trade commission on trade practice rules. The acceptance of any contract that does not insure a profit also was condemned. The opening of "some entirely unnecessary bar warehouses" in the past six months was declared ruinous for warehouses already legitimately in the field.

The institute's convention was to continue through Wednesday, Sept. 30. A feature of the program Sept. 29 was a series of 10-minute talks on "our problem" in 10 cities and districts.

Discuss Moving Scrap by Water from Boston

Possibility of moving steel and iron scrap by barge from Boston to Bridgeport, Conn., New York and Buffalo was discussed at the Sept. 24 meeting of the Boston chapter of the Institute of Scrap Iron and Steel Inc. The development of the Boston seaport as a principal scrap export market for foreign countries was urged through organization of an export association under auspices of the Institute.

R. Grossman, of Quincy, Mass., related experiences of a recent trip to Russia. Benjamin Schwartz, director general of the Institute, outlined the program of the forthcoming semiannual conference at Pittsburgh, Oct. 12-14. F. Zecchini, vice president of the Boston chapter, presided.

Soviet Must Pay Soon

In October the Russian government has a total payment of about $15,000,000 to make on tractor, farm implement and combine orders placed with International Harvester Co., Oliver Farm Equipment Co., Caterpillar Tractor Co., J. I. Case Co., Deere & Co., and Massey-Harris Co.

Scan Wages Before Raising Rates, States Advise I.C.C.

WASHINGTON—The wage issue, rigidly excluded by the interstate commerce commission from its hearings on the railroads' application for a 15 per cent advance in freight rates, wedged its way into oral arguments on the case when John E. Benton, speaking for the National Association of State Railroad and Public Utilities Commissioners, charged that rail wages are inflated considering that commodity prices and wages in other industries have been reduced.

Before an advance in rates is granted the railroad wage situation should be surveyed, declared Mr. Benton, who summarized his case: "If prices become stabilized on a deflated basis, you could not with justice raise railroad freight rates so that the railroad business would be the only one not to suffer from the effects of the depression."

Arguments In Case Ended

Oral arguments, which began Sept. 21, have been concluded, and the case is before the commission, with prospects of some action next month. Should an advance be granted, it would be the end of the year before it could be effective. Any forecast of action by the commission is pure speculation at this time.

W. W. Collins Jr., of the Jones & Laughlin Steel Corp., Pittsburgh, who was to have argued against the increase, did not present his case before the commission.

E. S. Ballard, appearing on behalf of the Ohio commission and the Ohio Lake Cargo Coal Rate committee and other Ohio coal producers, stated that his clients are not opposing the 15 per cent freight rate increase but they are against the special treatment accorded eastern coal interests with regard to the flat increase in rates made up on a key rate to preserve existing differentials between competing coal producing territories.

Charges Discrimination In Coal

Mr. Ballard said that this flat increase would amount to 28 cents per ton on lake cargo coal, and on commercial coal it would amount to 36 cents to Toledo and 46 cents to Chicago. Such an arrangement, he told the commission, would result in various percentages of increase being applied on differing shipments, and would result in preference and discrimination.

John C. Finerty, R. C. Fulbright and Robert E. Quirk, acting as a committee of counsel, appeared on behalf of the nonferrous metals industry to oppose the proposed advance on the ground the greater part of the industry already is paralyzed and any further freight charges would only further the effects of depression upon production and consumption.

Even steel has its softer moments. Here is a steel building that is the club house at a summer playground for under-privileged children of Kansas City, Mo. The building was donated by A. A. Kramer, president of the Columbian Steel Tank Co., Kansas City, and was erected on the foundations by Columbian workmen after shop hours

Sees Machine Tool Industry Embarking Upon New Era

UNIVERSITY OF DETROIT in connection with its course for training executives in the engineering and production branches of the metalworking industry, has laid out an unusual program of 65 lectures covering all phases of modern machine tool design and application. Also, six of the lectures will be devoted to business and social ethics and the legal aspects of industry.

The opening lectures of this series were delivered on Sept. 14 and 15 by Guy Hubbard, associate editor of STEEL, the subject being, "Trend of Machine Tool Design."

Unfolds Broad Perspective

Before audiences numbering over 400 on each evening, including many machine tool men of the Detroit territory as well as the student body, Mr. Hubbard, who is recognized as an authority on the history of the machine tool industry, developed a perspective view of the whole situation—past, present and future. In this way the background was created which effectively will be filled in by the specialists in specific kinds of machines and tools whose lectures will continue on into the spring.

Touching upon the history of machine tools, the speaker pointed out that as industries go, we still are relatively close to the beginnings of this one. Starting as a result of efforts to manufacture fire arms on the interchangeable system, an end successfully achieved by Eli Whitney in the early part of the 19th century, the building of machine tools did not, to any extent, become a distinct business in the United States until after the days of the Civil war.

As an example of our closeness to the beginnings, Mr. Hubbard cited the development of the turret lathe, which was not invented until 1856 and whose principal inventor and active developer, Henry D. Stone, lived until 1899. Also, of the automatic screw machine, which was developed from the turret lathe in 1873 and whose inventor, the late Christopher Miner Spencer, at the time of his death in 1922 actualy was chief engineer of a large machine tool company.

In comparison to the slow development of machine tools prior to 1900, and to their rather slow adaptation to high speed steel during at least 25 years following 1900, the speaker emphasized the unprecedented design changes which have taken place in the past two years.

Attributing what well can be called a revolution in the industry in part to recent development of tungsten and tantalum carbide cutting materials and in part to the efforts of leading machine tool builders to counteract the effects of the depression, Mr. Hubbard voiced the opinion that in no period, even of five years, have so many and so vital changes occurred as during the past 12 months. He interpreted the effect of all this upon machine tool using industries, using the term "accelerated obsolescence" to describe its marketing significance.

Foresees More Scientific Design

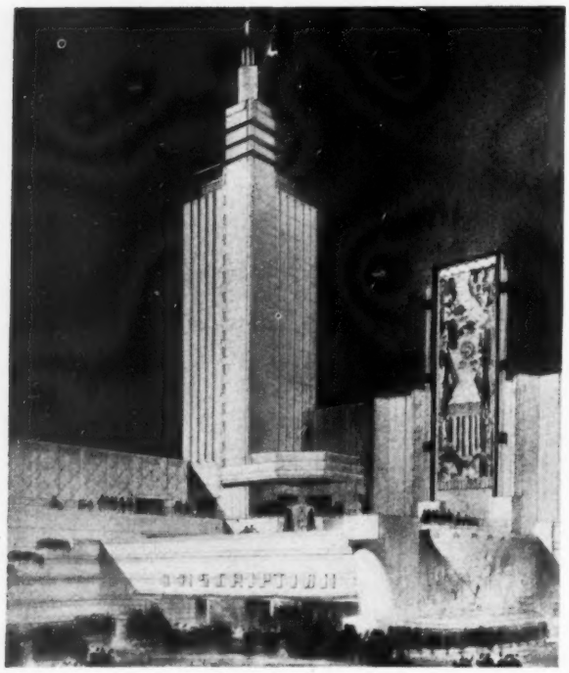
Looking into the future, the speaker predicted that high speeds, elimination of nonproductive time and demands for maximum operating convenience will force "rule-of-thumb" design methods into deserved disrepute and will broaden the field for trained mechanical engineers in the plants of progressive machine tool builders.

According to his conception of production machines of the near future, they will be built from the ground up to take full advantages of improved cutting materials, they will be equipped throughout with highly specialized antifriction bearings, lubrication systems will be laid out by lubrication engineers, and remote and automatic electrical control as well as electrical drive to units within the machine, will be general. Along this line, tool setting more and more will be controlled by the work itself, thereby making inspection an automatic function, enabling it to keep pace with production.

In reply to questions as to what all this development means in terms of "technological unemployment," the speaker cited some historical cases to show that what commonly is called technological unemployment might more correctly be called "technological readjustment." Invariably, improved machinery momentarily has thrown certain people out of work, but eventualy has given these same people and a great number of others more work under improved conditions and has given to the world in general comforts and conveniences which did not exist before, even for the wealthy.

Home Canning No Menace To Tin Plate Market

TIN plate manufacturers can view with few qualms the various campaigns to stimulate home canning of surplus fruits and vegetables. Were 1,000,000 housewives to put up 40 jars each and thereby obviate the purchase of 40,000,000 cans of goods from their grocers next winter, they would displace only the cans made from 5000 boxes of tin plate. In other words, the home canning of 40,000,000 jars would curtail the tin plate market only 1/3 of 1 per cent on the basis of its recent annual output



Steelwork has been placed for the Hall of Science, the fourth exposition building to be started for Chicago's 1933 World's fair. The building will be 400 x 700 feet, two stories and a mezzanine in height. It will rise from colored, concrete terraces, and will be decorated in white and gray, with trimmings of red and gold. At night it will be brilliantly illuminated by direct and fluctuating colored flood lights. The illustration depicts the interior of the court. The carillon-equipped tower is to be built of steel and concrete

Foreign Trade in Steel Products Reduced in August

DECLINES were recorded in both the export and import trade in iron and steel products during August. Exports, totaling 73,338 gross tons, were 11,128 less than the shipments sent abroad during July, while imports from foreign steel producers were 7051 tons under the previous month's figure and totaled only 30,139 tons according to the iron and steel division, department of commerce.

IMPORTS AND EXPORTS
Gross Tons

	1931		1930	
	Imports	Exports	Imports	Exports
Jan.	40,781	92,745	43,624	223,766
Feb.	28,045	91,212	43,326	197,225
March	40,401	109,512	56,618	238,329
April	47,872	101,081	53,686	208,604
May	37,176	91,407	54,315	195,425
June	37,819	75,585	48,953	159,273
July	37,190	84,466	39,083	131,580
Aug.	30,139	73,338	35,405	150,922
8 mo.	299,423	719,346	375,010	1,505,124
Sept.	.....	.....	40,285	131,045
Oct.	.....	.....	38,344	131,845
Nov.	.....	.....	43,098	111,979
Dec.	.....	.....	40,754	101,992
Total	.....	.....	537,491	1,981,985

Twenty-seven of the 46 classes of products included in this export trade showed reduced shipments in August, there being 18 increases and one instance in which the trade remained stationary. In point of tonnage the chief products in August's trade were black steel sheets, scrap, plain structural shapes, tin plate, and welded steel pipe.

Shipments to Europe and Africa were greater in August than in July, but those to all other areas were less. The trade with the countries of North and Central America and the West Indies, however, took in all 48.6 per cent of the August shipments.

ORIGIN OF AUGUST IMPORTS
Gross Tons

	Steel ingots, blooms	Steel scrap	Cast iron pipe	Steel bars
Austria	.....	.....	.....	4
Belgium	665	.....	65	1,703
Canada	.....	3,094	.....	1
Czecho Slovakia	.....	.....	.....	10
France	59	.....	52	672
Germany	150	.....	.....	1,559
Sweden	24	.....	.....	359
Unit. King.	5	.....	32	30
Total	903	3,094	149	4,338

Trade with Canada declined to 29,865 tons in August, black steel sheets, 8306 tons, plain structural shapes 7283 tons, and scrap 3142 tons, being the leading items imported by this market.

Imports of iron and steel products totaled only 30,139 gross tons in August, 7051 tons less than in July. Reductions in 21 of the 34 classes of products brought this about. Imports of pig iron dropped 3026 tons and those of structural shapes 1922 tons.

IMPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	August 1931	July 1931	August 1930
Pig iron	3,122	6,148	8,747
Sponge iron	.....	.....	.....
Ferromanganese, spiegeleisen (1)	2,295	2,917	2,236
Ferrochrome (2)	.....	.....	.....
Ferrosilicon (3)	.....	47	84
Scrap	3,094	2,471	1,511
Ingots, blooms	903	819	1,295
Concrete bars	2,930	3,039	1,747
Hollow bar, drill steel	175	208	126
Merch. steel bars	4,338	4,287	2,704
Iron slabs	.....	.....	2
Iron bars	11	130	49
Wire rods	333	687	317
Boiler, other plate	6	93	5
Sheets, skelp	630	1,413	2,927
Tin plate	18	36	24
Structural shapes	5,650	7,572	4,798
Sheet piling	.....	.....	517
Rails, fastenings	172	177	2,139
Cast pipe, fittings	149	681	28
Welded pipe	887	640	1,145
Other pipe	336	509	1,489
Barbed wire	962	1,492	461
Round iron	150	244	297
Flat wire, strip	50	91	60
Wire rope	121	69	145
Other wire	31	48	34
Hoops and bands	1,946	1,867	1,734
Nails, tacks	1,305	1,091	636
Bolts, nuts, rivets	37	138	12
Castings, forgings	238	64	70
Total	30,139	37,190	35,405

(1) Manganese content.
(2) Chromium content.
(3) Silicon content.

DESTINATION OF AUGUST EXPORTS
Gross Tons

	Galvanized steel sheets	Tin, terne plate	Black sheets	Steel bars
Argentina	13	874	71	8
Brazil	100	253	23	8
Canada	427	89	8,306	355
Central Amer.	140	1	6	47
Chile	8	200	21	514
China	122	445	287	199
Columbia	242	10	7	12
Cuba	112	12	6	8
Dutch E. Ind.	232	.....	.....	.....
Finland	25	.....	.....	.....
France	.....	.....	591	.....
Greece	.....	.....	.....	3
Italy	.....	.....	1	.....
Japan	61	1,249	198	49
Java	5	138	3	.....
Mexico	130	762	54	13
Norway	77	.....	.....	1
Panama	11	.....	.....	26
Philippines	834	638	.....	190
Peru	27	376	178	63
Soviet Russia	.....	.....	.....	6
United King.	3	.....	737	281
Uruguay	51	115	69	2
Venezuela	196	10	2	33
Total	2,976	6,643	10,610	1,984

ORIGIN OF AUGUST IMPORTS
Gross Tons

	Iron ore	Pig iron	Manganese	Ferro manganese
Algeria	6,650	.....	.....	.....
Australia	15,530	.....	.....	.....
Belgium	.....	200	.....	.....
Brit. Ind.	.....	1,555	2,593	.....
Brazil	.....	.....	5,916	.....
Canada	380	1,094	4,933	2,116
Chile	21,652	.....	.....	.....
Cuba	11,000	.....	.....	.....
Germany	.....	.....	14	79
Japan	.....	20	.....	.....
Kwantung	.....	100	.....	.....
Mexico	235	.....	.....	.....
Netherlands	.....	50	.....	.....
Norway	.....	38	.....	.....
Sweden	14,261	50	.....	.....
Soviet Russia	22,200	.....	8,574	.....
United King.	.....	15	22	100
Total	91,908	3,122	22,052	2,295

EXPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	August 1931	July 1931	August 1930
Pig iron	891	370	765
Ferromanganese, spiegeleisen	68	88	1,006
Iron and steel scrap (including tin plate scrap)	10,424	13,460	19,630
Ingots, blooms	143	309	165
Iron bars	90	139	338
Steel bars	1,984	1,645	4,840
Alloy steel bars	133	100	291
Wire rods	2,167	1,708	3,179
Boiler plate, not fabricated	3,000	3,616	6,799
Skelp	2,503	8,753	7,925
Iron sheets, galv.	218	198	565
Steel sheets, galv.	2,976	5,192	5,219
Steel sheets, black	10,610	6,952	6,537
Iron sheets, black	246	329	910
Hoops, bands, strip	1,811	1,610	2,194
Tin, terne plate	6,643	8,790	20,927
Shapes, not fabr.	7,937	7,133	10,294
Shapes, plates, fabr.	1,370	1,232	4,933
Metal lath	212	173	325
Frames, sashes, sheet piling	593	128	3,620
Rails	2,392	3,084	18,298
Rail fastenings	610	1,133	2,409
Boiler tubes	534	416	929
Casing, pipe, seamless and welded	1,740	1,115	4,157
Malleable - iron screwed pipe fittings	255	267	715
Iron screwed pipe fittings	139	120	551
Cast-iron pressure pipe, fittings	710	782	646
Cast-iron soil pipe fittings	459	413	659
Welded black, galv. steel pipe	4,534	6,023	7,743
Welded black, galv. wrought pipe	330	602	1,258
Plain black or galv. wire	1,417	1,049	1,708
Barbed wire, woven-wire fencing	2,342	2,169	2,127
Woven - wire screen cloth	74	117	214
Wire rope	144	178	306
Other wire	320	320	511
Wire nails	622	943	816
Tacks	40	70	30
Bolts, nuts, rivets	401	437	758
Iron castings	306	369	417
Steel castings	295	270	845
Car wheels, axles	423	561	1,047
Forgings	416	523	712
Total	73,338	84,466	150,922

Industrial Men in the Day's News

Ross L. Leffler, Department Superintendent, Carnegie Steel Co.

TWENTY-ONE years ago he entered the Duquesne works as timetaker, today he heads three important departments of this Carnegie plant.

BORN in Montana, schooled in the east and a university graduate of the Middle West is his educational record.

SURCEASE from mill duties is found in the Pennsylvania Game commission, of which he is president.

ROSS L. LEFFLER, recently appointed superintendent of blooming mills, chipping yards and roll shop departments of the Duquesne, Pa., plant of the Carnegie Steel Co., Pittsburgh, as noted in the July 16 issue of STEEL, has been identified with the company slightly more than 20 years. His recent promotion follows several others through various positions in the clerical and operating departments.

Mr. Leffler was born in Butte, Mont., Aug. 7, 1887, and received his earlier education in the grade and high schools of Bucksport, Me., and Boston, later attending the University of Michigan. His first connection with the steel industry was in October, 1910, when he joined the Carnegie Steel Co. as timetaker at the Duquesne works. This was followed by a period of service as clerk and draftsman. Mr. Leffler first became identified with the operating department as assistant foreman of the roll shop and later was promoted to assistant superintendent of that division, which position he held until his recent appointment as superintendent of the roll shop as well as the blooming mills and chipping yards.

Mr. Leffler finds his chief interest outside his work in activities of the Pennsylvania State Game commission, of which he is president.

R. C. TODD, formerly assistant general sales manager of the American Rolling Mill Co., Middletown, O., has been appointed assistant vice president of the company. Mr. Todd, who joined the Rolling Mill company in 1900, at one time was Detroit district sales manager, returning to Middletown in 1924.

H. M. Richards, manager of sales for the Cleveland district, has been appointed assistant general manager of sales, with headquarters at Middletown. With the Rolling Mill company since 1913, he joined the sales force in 1917, and since has been in Pittsbugh and Cleveland territory.

Foster E. Wortley, assistant district manager of the Pittsburgh office, succeeds Mr. Richards as manager of sales at Cleveland. He has been with the sales division since 1912. O. L. Conley is assistant manager at Cleveland.

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R. M. Laning, formerly general manager at Monroe, Mich., for the Newton Steel Co., has become affiliated with the Otis Steel Co., Cleveland, as assistant general superintendent. Mr. Laning was identified with the Newton company since 1928, when he became general superintendent at Newton Falls, O., later going to Monroe. Mr. Laning resigned from the Newton Steel Co. early in May, 1931, and became affiliated with the Steubenville, O., works of the Wheeling Steel Corp.

He succeeds Albert H. Shonkwiler at the Otis Steel Co., recently resigned, who is now with the Wheeling Steel Corp. at its Steubenville, O., works.

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A. J. Bates, of the Bates Expanded Steel Truss Co., East Chicago, Ind., has resigned.

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Louis J. Voyer, formerly district manager of sales in Youngstown, O., district for Newton Steel Co., Monroe, Mich., and appointed Cleveland district manager of sales for the same company in August, 1931, has resigned.

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E. F. Ware has been appointed southwestern sales representative of the Toledo Steel Products Co., Todelo, O., with headquarters at Dallas, Tex.

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Charles H. Bauer, for the past six years manager of the automotive division of the L. H. Gilmer Co., Philadelphia, has been made general sales manager of the company. Mr. Bauer is international president of the Automotive Boosters clubs and a counsellor of the Motor and Equipment association.

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LaMonte J. Belnap, who as president has been directing the manufacturing, sales and financial activities of the Worthington Pump & Machinery Corp., Harrison, N. J., has been elected chairman of the executive committee.

Harry C. Beaver, vice president of

the Worthington corporation and associated with it for 25 years, has been elected president to succeed Mr. Belnap.

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Howard H. Cook, since 1910 assistant secretary of the American Iron and Steel institute, New York, was elected secretary, Sept. 25, to succeed the late E. A. S. Clarke.

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L. A. Blackburn, formerly works manager for the Oakland Motor Car Co., Pontiac, Mich., and previously with the DuPont interests, has been made president of the Evans Appliance Co., Detroit, manufacturer of pumps. Mr. Blackburn is a graduate of the University of North Carolina.

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Dr. H. Foster Bain has resigned as secretary of the American Institute of Mining and Metallurgical Engineers, effective Nov. 1, to become affiliated with the Copper and Brass Research association, New York. A. B. Parsons, assistant secretary, will succeed Dr. Bain for the duration of the latter's term, which expires Feb. 15, 1932.

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C. W. Mayer, who retired Aug. 1 as manager of the Indianapolis office of the Crucible Steel Co. of America, was recently tendered a testimonial dinner by his friends. Mr. Mayer's experience in the steel industry dates back to 1893, when he became bookkeeper for the Park Bros. Steel Co. at Cincinnati. When William G. Park, president of the company, consolidated some tool steel companies as the Crucible Steel company in 1900, Mr. Mayer opened the branch in Indianapolis.

Obituaries

JOHN G. MESKER, 62, until his retirement a year and a half ago, works manager for the Bruce-Macbeth Engine Co., Cleveland, for 20 years, died at Cleveland, Sept. 22, following an operation. Mr. Mesker was connected with the Cleveland Shipbuilding Co., Cleveland, and when this company was acquired by the American Shipbuilding Co. he became associated with one of that company's plants. Later he went with the Bruce-Macbeth company. Mr. Mesker was a brother of L. H. Mesker, of the Cleveland Planer Co.

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Charles G. Upham, 77, president of the Diebold Safe & Lock Co., Canton, O., died recently.

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Clemuel Ricketts Woodin, 86, pioneer railroad car builder, and father of William H. Woodin, president of the American Car & Foundry Co., died Sept. 25, at Berwick, Pa. He was born in Cambria, Pa., and was associated with Jackson & Woodin Mfg. Co., of which he was president, from 1872 to 1894. When this company was absorbed by the American Car & Foundry Co. in 1901, he became a member of the executive committee of the latter company, a position held until his death.

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F. I. Sheehan, 33, Pacific Coast district manager for the M. H. Detrick Co., Chicago, and formerly chief engineer for that company was killed Sept. 16 in an airplane accident in San Francisco bay.

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William H. Bissel, Pacific Coast manager for the Wickwire Spencer Steel Corp., New York, was killed Sept. 16 in an airplane crash at the Oakland, Calif., airport. Mr. Bissel, who was 47, had been coast manager 2 years and with Wickwire Spencer 7 years.

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Thomas W. Suddard, 39, secretary and plant manager, Hamilton Mfg. Co., Two Rivers, Wis., died Sept. 11. He joined the Hamilton company in 1911 to direct the organization of its steel printing furniture and dental laboratory equipment department. In 1919 he was elected secretary and given entire charge of plants.

Financial News of Steel Industry

ALLEGHENY Steel Co., Brackenridge, Pa., has declared three monthly dividends of 5 cents each, dates being, respectively, Oct. 19 to record Sept. 30, Nov. 18 to record Oct. 31, and Dec. 18 to record Nov. 30. The company paid 10 cents monthly previously.

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General Fireproofing Co., Youngstown, O., has reduced its annual dividend on common to $1 from $2 by declaration of a 25-cent dividend for the current quarter. The usual dividend of $1.75 on preferred stock was declared. Both dividends are payable Oct. 1 to record Sept. 19.

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Interlake Steamship Co., Cleveland, declared the quarterly dividend of 50 cents a share payable Oct. 1 to record Sept. 19. Dividend was unchanged from the previous quarter.

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Perfect Circle Co., Hagerstown, Ind., has declared an extra dividend of 25 cents in addition to the regular third-quarter dividend of 50 cents a common share. Both dividends are payable Oct. 1.

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Pittsburgh Steel Co., Pittsburgh, for year ended June 30, shows net loss of $1,715,726 after depreciation and depletion, against net profit of $1,689,692 in the preceding fiscal year.

August Auto Production Dips Below 200,000 Mark

Inroads of vacation and the seasonal slackening in demand resulted in a decline in automobile production in August, the total being 187,197 units. Thus STEEL's early prediction that output would be between 180,000 and 190,000 units is borne out. Production figures following are by the department of commerce:

	—United States—			Canada
		Passenger		
1930	Total	cars	Trucks	Total
Aug.	224,368	185,619	38,363	9,792
8 mo.	2,688,481	2,265,722	417,369	130,665
Sept.	220,649	177,752	41,967	7,957
Oct.	154,401	115,476	38,343	4,541
Nov.	135,754	102,358	33,787	5,407
Dec.	155,701	122 748	31,528	5,622
Year	3,355,986	2,805,5f6	541,534	154,192
1931				
Jan.	171,851	137,805	33,534	6 496
Feb.	219,939	179,890	39,520	9,871
Mar.	276,341	230 835	45,096	12,993
April	336.939	286,252	50,022	17.159
May	317,163	271,135	45,688	12,739
June	250,657	208 955	41,342	6,835
July	218.961	182.927	35,854	4,220
Aug.	187,197	155,321	31,772	4,544
8 mo.	1,978,622	1,655,246	320,276	74,856

Electrical Trucks, Tractors In August Reversal

Due in large measure to declining domestic business, shipments of electrical trucks and tractors in August were off from July and depressed to a second low for 1931. Foreign shipments held moderately. Department of commerce compilation shows eight months of 1930 almost 50 per cent behind the same 1930 period:

		—Shipment—	
1930	Total	Domestic	Export
August	92	81	11
8 mo.	949	833	116
September	81	75	6
October	93	90	3
November	45	36	9
December	51	42	9
Year	1,191	1,050	141
1931			
January	38	33	5
February	56	50	6
March	93	84	9
April	71	48	23
May	69	69	.....
June	75	50	25
July	78	63	15
August	50	37	13
8 mo.	530	434	96

Accept Screen Standard

Washington—Enough manufacturers, distributors, users and others interested in the simplification of wire insect screen cloth to insure general adoption of the program by the industry as a whole, have approved the simplified practice recommendation, which will be effective as of Oct. 15, 1931.

F. o. b. PITTSBURGH

PITTSBURGH

BUSINESS conditions of the past year have served to check, temporarily at least, the trend toward mergers so noticeable during the preceding prosperous period. Mills have been too busily engaged in adjusting their operations to meet the reduced tempo of depression to give much thought to matters of expansion, but it is believed that the industry is likely to witness additional groupings when the pressure of present conditions has eased.

The depression already has left its mark upon operating practice and upon producing facilities. Production has been concentrated at the low cost plants and the deficiencies of out-of-date equipment have become apparent. Companies having a large number of individual plants have been most active in this weeding out of obsolete facilities.

One unit of the United States Steel Corp. found it could make some products at Chicago and ship to Pittsburgh as cheaply as they could be produced at certain plants in this district, and the latter mills are not expected to run again.

Just as the depression has been the proving ground of individual plants and equipment, so also has it provided a stiff test of the earning ability of different companies, all of which is expected to have an important bearing upon what steps are taken later in the way of mergers. In this connection, the excellent showing of the National Steel Corp. this year is outstanding and stamps the company as one of the most attractive of the independent producers from the standpoint of any expansion ambitions of the larger interests.

Detroit Position Strategic

Advantages which the National properties would bring to an alliance are obvious, particularly the strategic location of the former's plants in order to take advantage of the huge automotive steel market. Its nearby sheet mills are conveniently situated to make use of river transportation to the South and Southwest. National is holding its plans for a Chicago plant in abeyance for the present.

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Builders of steel mill equipment report an increase in inquiry recently. Business for these companies has continued good during the time when steel production steadily declined, and prospects still are favorable. The improvement noted in inquiry is confined mostly to miscellaneous equipment, although a fair amount of heavy machinery is under consideration.

A definite change for the better in general conditions, it is believed, would result in the placing of considerable business. The equipment industry has been aided in a measure by the depression and consequent emphasis upon cost reductions, although at the same time the desire of users to conserve capital has retarded expenditures. These are expected to be made, once operations and profits assume an upward course.

Inquire, but Do Not Buy

Better inquiry but hesitancy in awards also is noted by builders of river equipment here. Barge inquiry is described as the best in six months. This situation reflects the steadily increasing interest of shippers in river transportation, as well as the belief that business conditions and traffic are destined for improvement next year, although there is a tendency to delay the placing of orders until some signs are evident of a turn in conditions.

River traffic recently has been the lightest in several years, except that transportation of steel products on the longer hauls to the Mississippi river and southern points has been better maintained than on the Monongahela river, where activity is guided to a large extent by interplant movement.

River transportation may be expected to feel the effects to a certain extent of an increase in rail freight rates if the latter event occurs, particularly if consistent progress is made in the providing of adequate service on the inland streams. Some oil companies have taken an arbitrary position on the question of the proposed rate increase, pointing out that higher rates merely will divert the transportation of more of their products to pipe lines, barges and trucks, thereby resulting in less rail revenue.

Barge awards so far this year involve about twice as much steel tonnage as did orders placed during all of 1930. Of the 43,000 tons in 1931 contracts, however, 25,000 tons represent the large order placed in January by the Inland Waterways Corp. Awards during the past three months have been light and operations of local yards currently are at a low rate. Action on pending work would result in considerable activity.

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Pipe line production is nearing the end of its busy period, and although some miscellaneous business is expected before the end of the year, the larger lines scheduled for early laying have been placed. Business has been disappointing to a certain extent considering the large volume of work that appeared in prospect during the first quarter, but has made a better showing than seemed likely at midsummer. Awards for major lines this year involved about 500,000 tons of pipe, while last year the larger projects reported totaled around 900,000 tons.

More Pipe to Pittsburgh

Of the 1931 total so far about one-half went to Pittsburgh mills, the remainder being divided between Youngstown producers and the A. O. Smith Corp. This is in contrast to conditions two to three years ago when the Mil-

waukee interest was the sole operator of the electric welding process of producing line pipe.

Spang, Chalfant & Co. Inc. now is engaged in the building of a plant for the employment of a form of this process and upon its completion all of the major producers of tubular products in the steel industry will have such facilities at their disposal.

Difficulties in financing and quietness in general business this year served to curtail the activity in pipe line construction that had assumed such large proportions in 1929 and 1930, but many additional lines still are in prospect and are looked to be placed eventually.

The piping of natural gas still predominates in the list of other proposed lines, consummation of which will depend upon several factors including probable consumption and extent of supply. The Tioga gas field in northern Pennsylvania gives promise of developing into a major gas producing field and one that may result in the laying of a number of pipe lines in addition to the one recently ordered to be used in carrying gas to Syracuse.

Survey Route for Canal

Another step has been taken in the proposal to link Pittsburgh and the Ohio River valley with the Great Lakes through the building of a canal. The Lake Erie and Ohio River Canal Board of Pennsylvania has retained a Chicago waterways company to survey the route by way of the Beaver, Mahoning and Shenango rivers to a point on Lake Erie near Ashtabula, O., and the work is to be completed in time for a report to congress at the next session.

This route was agreed upon by Pittsburgh and Youngstown interests last year and if carried out will mean considerable saving in the cost of transportation of raw material to this district as well as in the distribution of finished products. Youngstown steel mills would benefit through lower charges on the movement of coal from mines to plants by virtue of the water service.

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Coal operators believe conditions in their industry have been at their worst this year and that a change for the better is not a far removed possibility. The bituminous industry's troubles are something apart from the general business depression, profitless operations having prevailed even during the period of otherwise good industrial activity.

Coal prices were well deflated before commodity prices commenced their long decline two years ago and the restricted demand for coal since that time has had little additional effect upon quotations, although it has depressed earnings substantially.

Producers place little faith in the ability of the government to correct the ills of the industry, which consist principally of an excess of supply over demand. This attitude was demonstrated at the diffidence of the various interests toward responding to the invitation to meet at Washington for a conference on the subject.

The past few months have been productive of various plans proposed to bring about an orderly and economic adjustment of operations and to provide a fair return to operators and employes alike, none of which proposals, however, has been received with wholehearted enthusiasm by the individual operators.

These programs have varied from one that would place the government in control of the activities of the industry to the so-called "Wheeling Plan." The latter, which has received considerable publicity, would set up a new competitive field in western Pennsylvania, eastern Ohio and the Panhandle, Morgantown, Fairmont and Kanawha regions in West Virginia.

An impartial tribunal appointed by the governors of the three states would form the operators into a unit. Engineers would determine potential production and consumption and rate individual properties, and production would be balanced with relation to consumption by district and by day.

The coal industry is a rather unwieldly organization, consisting of so many individual units, and the difficulties in obtaining accord toward the adoption of a radically different method of operation are apparent, particularly in the case of those companies who naturally resent being told how to run their business or what tonnage of coal they may produce.

Here and There in Industry

REPUBLIC METALS INC., 2222 West Forty-ninth street, Chicago, has opened a warehouse in which it will carry a stock of steel and metal sheets, tin plate and other materials required in the sheet metal shop. Officers formerly were in the sales division of the Republic Metalware Co., which recently discontinued this branch of its business. Walter J. Joy, formerly sales manager at Chicago, is president, E. E. Olson vice president, and E. F. Mahlberg secretary. The latter were salesmen for the former company.

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Kuethe & Kuehl Machine Works, Marshfield, Wis., has changed its name to Kuethe & Kohs Machine Works. August Kuehl, for 20 years a member of the firm, has sold his interest to Albert Kohs.

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Delta Chemical & Iron Co., Escanaba, Mich., will reopen its plant Oct. 1, after being shut down part of the summer while new buildings were being constructed for use of a new process in acetic acid manufacture. George C. Craver is general manager.

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E. & G. Brooke Iron Co., Birdsboro, Pa., which has taken over the sale of its pig iron which formerly was sold through Pilling & Co. Inc., Philadelphia, will handle sales at its offices at Birdsboro, in charge of Robert C. Brooke. Walter J. Savournin and Frederick F. Newcomb, formerly with the Pilling organization, will continue as salesmen.

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Modern Iron Works, Reading, Pa., recently organized, is building a plant in which to fabricate structural steel, ornamental iron, brass and bronze. John Bauman is president and treasurer, and John H. Herbein secretary and assistant treasurer.

□ □ □

Commercial Centerless Grinding Co., 6538 Carnegie avenue, Cleveland, recently established by E. E. Brundell, is specializing in centerless grinding for manufacturers. Mr. Brundell has been connected with Cincinnati Grinders Inc., Cincinnati, as assistant superintendent.

□ □ □

Kelsey-Hayes Wheel Corp., Detroit, has contracted with the Surface Combustion Corp., Toledo, O., for installation of a second gas-fired continuous lead hardening furnace in its plant on Military avenue, Detroit. The furnaces are to be used for lead hardening of rear wheel truck hubs.

□ □ □

Chapman Valve Mfg. Co., Springfield, Mass., which bought the Coffin Valve Co., Boston, will move the Squantum plant of the latter to Springfield, where manufacturing operations will be combined with those of the parent company. The Coffin plant is one of the largest and oldest manufacturers of sluice gates in the world.

EDITORIAL

The Right Steel in the Right Place

AMONG the significant aspects of the meeting last week in Boston of the American Society for Steel Treating, the American Welding society and other associations was the emphasis placed upon the need of greater co-operation between the makers and users of steel. The subject is not new, but the manner in which it was handled in the discussion of numerous papers indicated that producers and consumers are approaching the problem from a more constructive and more practical viewpoint than heretofore.

At times in the past there has been doubt as to who should specify the kind of steel best suited for a given purpose. Many steel consumers have insisted on buying according to specifications of their own making, thus accepting full responsibility for the results. On the other hand, a number of steelmakers—especially those whose product is highly specialized—have attempted to advise customers as to the type of steel they should use, claiming that such supervision of the application of their steel guarantees more satisfactory results.

The two policies conflict and yet both are prompted by the same motive. Maker and user are concerned chiefly with insuring maximum service through fitting the material to the requirements of the job. However, in spite of this strong incentive of common interest, co-operation between producer and consumer has not been all that could be desired.

Specifications Improperly Used Often Tie Hands of Steelmaker

For this reason the frequent references to the subject throughout the discussions at Boston are gratifying. Directly to the point was the following statement by Dr. C. H. Herty Jr., Campbell memorial lecturer for 1931:

"The steelmaker supplies the consumer with steel to a given chemical analysis, combined in many instances with a physical, grain size or cleanliness specification. Oftentimes the filling of one specification will make it very difficult to meet another and it is on this point that the consumer should most certainly put considerable thought. A higher manganese specification will promote greater cleanliness and a higher silicon specification will give freedom from at least one type of ghost line. The consumer often is entirely to blame for the kind of steel he gets because his specifications do not allow the steelmaker to use available materials to the best advantage, and in some instances force him to use these materials to his own and the consumer's disadvantage.

"At some not too distant day the art of steelmaking will be superseded by the science of steelmaking, but the consumer must play his proper role in this change."

Doctor Herty's statement is a timely plea to steel consumers to accord steelmakers freedom from the restraint of unintelligent specifications. It also indicates by inference that the more consumers know of the producers' problems and the more the maker knows of the users' requirements the sooner a higher degree of co-operation will be effected.

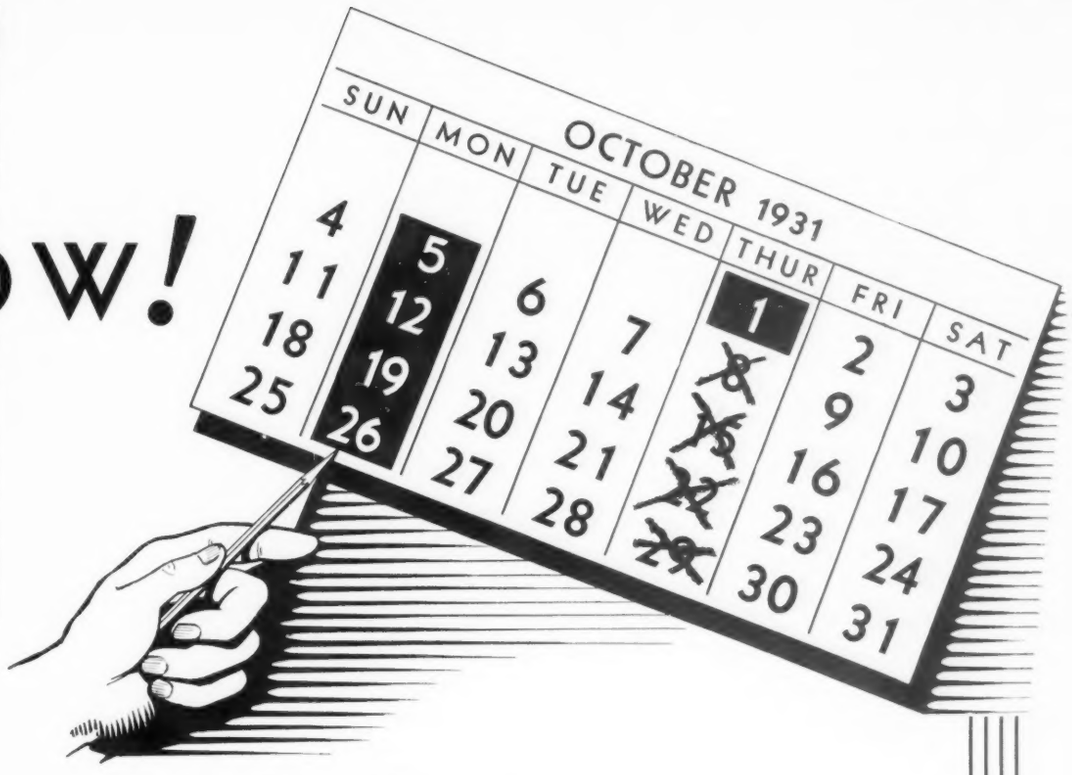
Free Exchange of Data on Problems of Maker and User Is Necessary

This point was again emphasized in a discussion on steels for difficult stampings. Edward S. Lawrence, after pointing to the necessity for a better understanding between manufacturers of strip and sheet steel and fabricators of these products, declared:

"This (better understanding) will come only when the sheet and strip manufacturers are willing to divulge to their consuming public the basic knowledge of the manufacture and application of their sheet and strip steels, and furthermore, when the consumer in turn will study more carefully his equipment for pressing and drawing, and divulge such knowledge to his suppliers."

Again in discussing "Tool Steel from the Consumer's Standpoint," H. G. Keshian urged makers of tool steel determine and make available to users the properties of tool steels just as accurately and completely as the properties of S. A. E. steels are made known to consumers of these steels. While Mr. Keshian's remarks have a bearing on the old controversy of "brands" versus analyses, the broader significance of his plea is that the users need more specific data.

From the foregoing and other statements made at the Boston meeting it is clear that industry will gain much from a freer exchange of information on making and using steel. It is a problem to which every company in the steel industry should give constructive thought and action.



CHANGE IN ISSUE AND DELIVERY DATE

Week beginning October 5, our issue and delivery date becomes Monday instead of Thursday.

In this manner, our editorial functioning and presentation are adjusted to the calendar week, which our study and investigation show is more logical, and will enable us to serve our field more effectively.

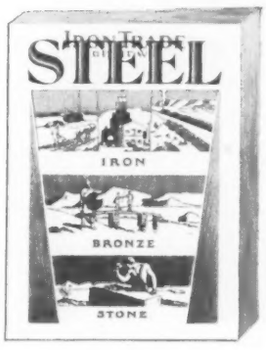
Each issue will be current for a full week, whereas previously, the issue dated and delivered on Thursday was current for the remainder of the week only, becoming "last week's issue" on the following Monday.

This change will serve further to increase reader interest and advertising value. Other changes over the past 15 months include:

1.—*Change in editorial functioning, to more definitely outline our field, and present increasing amount of data with decreasing demands on readers' time.*

2.—*"Flat Make-up", to give visibility to all advertising.*

3.—*Change in name from "IRON TRADE REVIEW" to "STEEL".*



PRODUCTION

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PROCESSING

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DISTRIBUTION

—

USE

STEEL

For forty-eight years—IRON TRADE REVIEW
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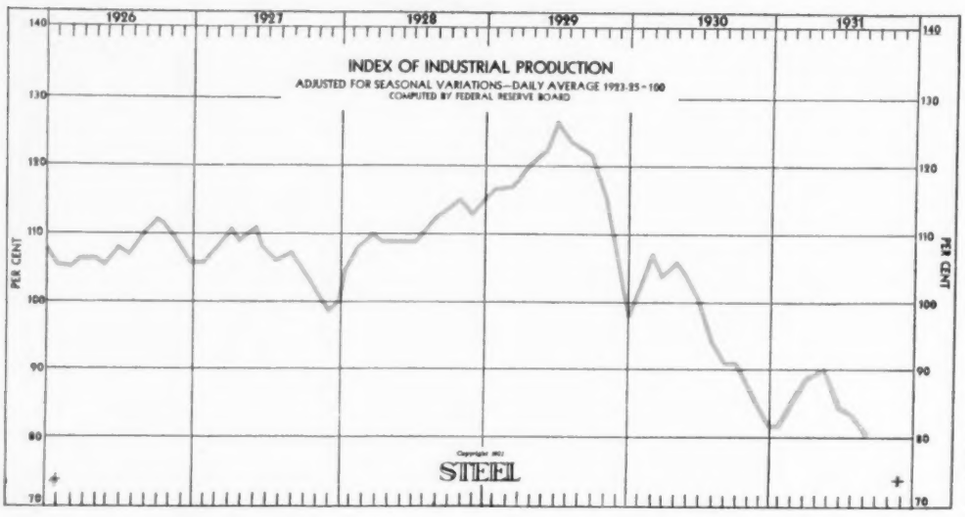
THE BUSINESS TREND



1930	
Aug.	91
July	94
June	100
May	104
April	107

1931	
Aug.	80
July	83
June	84
May	89
April	90

Business Stands Still But Sentiment Improves

IN SPITE of the fact business has not improved perceptibly during the past fortnight, the outlook is brighter. The situation may be likened to that of a sick man who has known for some time that a few major operations must be performed on him before he can hope to recover. The thought of these impending ordeals makes him nervous, depressed and impotent, but once the necessary surgical work has been performed he feels better and looks forward more confidently to early recovery.

Business has been due for hospital treatment for several months. Home remedies, such as stringent economies, reduction of dividends and salaries and other measures helped but did not cure the patient. Therefore business last week submitted to the long dreaded ordeal of a wage cut. A few economic doctors declare that the operation will do more harm than good but the majority think it was one of the best things that could have been done to help the patient.

Demand Is for General Deflation as Quickest Way Out of Depression

Several other recent developments will have a remedial effect. England's suspension of the gold standard is a move in the right direction in clearing an aspect of international credit which had possibilities for further complicating the American patient's ills. At home the crystallizing of sentiment in favor of government economy is a favorable sign. Mr. Hoover's statement to the American Legion, his further arguments for a cessation of public expenditures, and the growing clamor throughout the land for reductions in salaries of public officials all bear evidence of constructive thinking.

The most important remaining problems are the railroad rate controversy and the banking situation. Strong pressure is being marshalled to grant the roads' request for an increase. If higher rates are authorized, the act will be in sharp contrast to reductions in almost every other phase of industrial activity. It might make it difficult or impossible to reduce the wages of railroad labor. Certainly it would defeat the policy of nation-wide deflation which seems to be demanded by the majority of business leaders.

Freight Rate Problem Is Complicated By Restrictions on Regulation

Meantime on the other hand, the investors in railroad securities—a powerful group—declare railroad profits are more essential to prosperity than the continuance of present rates. If the railroads were a private business instead of a government regulated business, branch lines would have been abandoned, service curtailed, wages cut and other economies effected so that the necessity for higher rates would not have developed at this time.

Frequent bank failures are undermining confidence more than any other single factor. It would seem desirable for banking authorities to lay their case before the public. If the man in the street could know the real strength of the majority of banking institutions, much of the present fear would be allayed.

In the meantime business is marking time. Steel operations continue at low levels. Prices of commodities still fluctuate within narrow limits, with quotations of iron and steel products remaining practically stationary. Car loadings are tending downward, having failed to exhibit a seasonal trend.

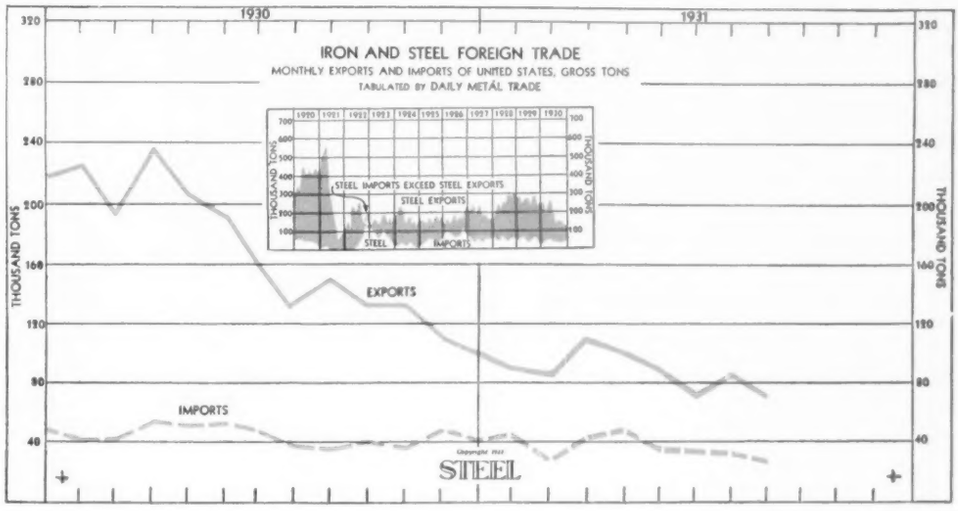
On the whole, the wage decision, the British action and the increased pressure for federal economy are favorable developments, which should speed the day of recovery.

Exports

	Tons
Aug., 1931	73,338
July, 1931	84,466
Aug., 1930	151,235

Imports

Aug., 1931	30,139
July, 1931	37,190
Aug., 1930	35,387

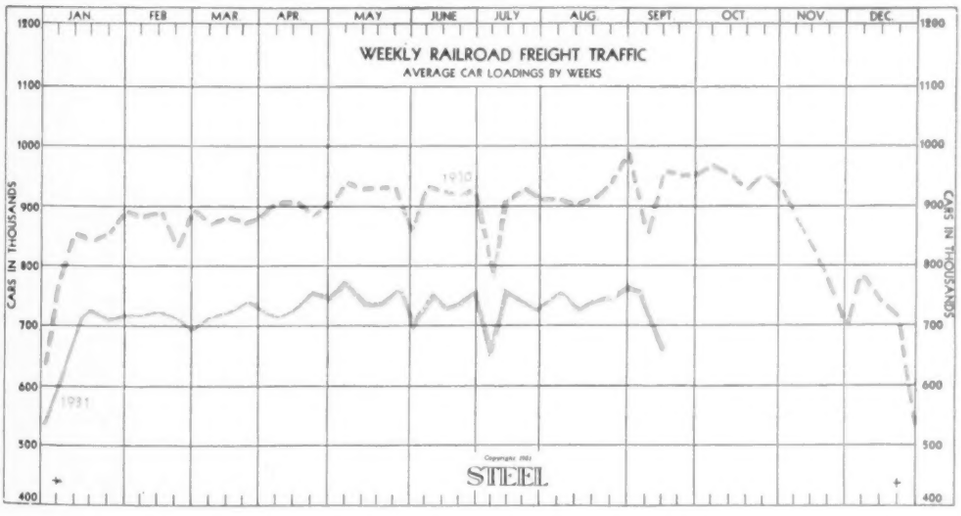


Foreign Trade in Iron and Steel Continues To Lose Ground

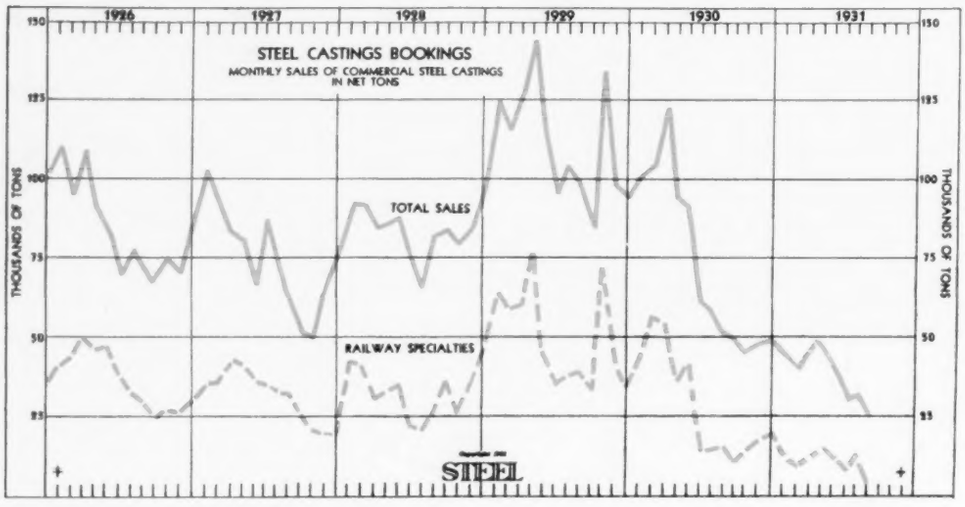
Both in exports and imports, the foreign trade of the United States in iron and steel recorded declines during August. For exports the drop amounted to 11,128 tons, with the result that the August shipments, 73,338 tons, broke through the low established in June. Imports were 30,139 tons, under those of July by a margin of 7051 tons, and except for last February, when imports were 28,045 tons, also a new low. In the export trade there were 27 decreases against 18 increases. In imports reductions took place in 21 of the 34 classes, the principal items of loss being pig iron and structural shapes. Exports averaged 2366 tons and imports 972 tons per day during the month.

Sharp Decline in Freight Traffic Is Due to Seasonal Factor

The holiday drop in freight car loadings exhibited in the week ended Sept. 12 resulted in the loading of only 667,750 cars. This is approximately the same level to which loadings fell during the holiday week early in July. The drop was from 759,546 cars in the previous week, following a small decline at that time, which broke up the small rises occurring in the latter part of August. A year ago freight car traffic rose sharply just before the Labor Day week and when the seasonal slump took place loadings were 965,813 cars. The gradual movement upward toward the fall peak in October has been little in evidence this year. This trend was slight in 1930, but marked in 1929.



	1931	1930
Sept. 12	667,750	965,813
Sept. 5	759,546	856,637
Aug. 29	763,764	984,504
Aug. 22	748,711	940,558
Aug. 15	742,736	922,823



Total New Bookings

	Tons
Aug., 1931	28,016
July, 1931	32,869
Aug., 1930	50,370

Railway Specialties

	Tons
Aug., 1931	6,848
July, 1931	13,621
Aug., 1930	15,285

Orders for Miscellaneous Castings Rise But Railway Business Sets New Low

Bookings of steel castings in August were influenced by conflicting trends, a decided drop in railway specialties more than offsetting a moderate gain in miscellaneous castings. New orders totaled 28,016 tons in August, compared with 32,869 tons in July. Excepting for the June output this was a new low. A year ago 50,370 tons were booked. Railway specialties struck a new low at 6848 tons after gaining substantially to reach 13,621 tons in the previous month. Orders for miscellaneous castings, however, were up nearly 2000 tons to 21,168 tons, the best total since last May. Total production was off slightly to 30,920 tons, also a new low, but railway specialties gained a trifle.

Sheet Steel Activity Lower as Stocks, Sales and Production Are Curtailed

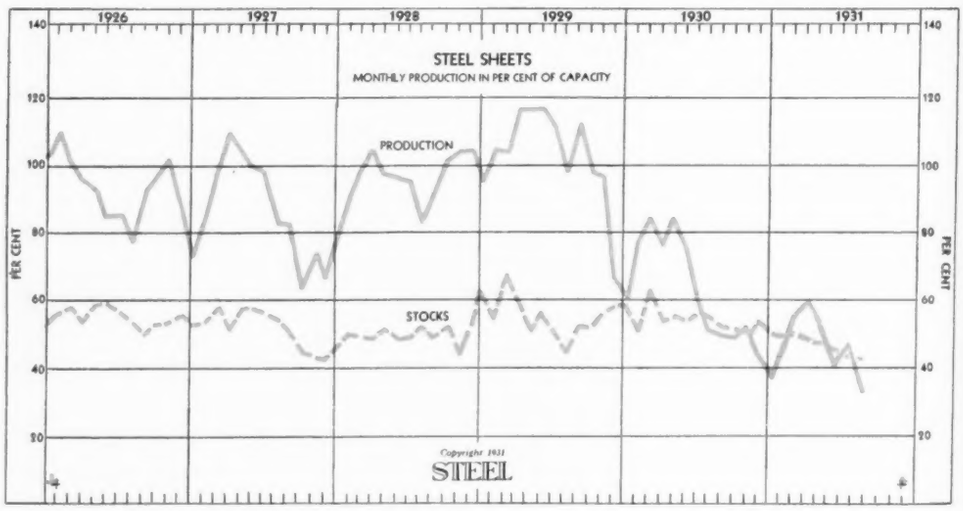
Activity of independent sheet steel producers slackened in August according to the report of the National Association of Flat Rolled Steel Manufacturers. Sales, production, shipments and stocks all declined from July levels. Sales which in July were at the rate of 38.2 per cent of capacity fell to 34.6 in August. Production declined from 46.3 to 34.9 per cent; shipments from 47.2 to 42.7 per cent; and stocks from 42.6 to 42.1 per cent. August activity represents the sharpest curtailment of the year and the lowest level in many years. In August last year sales and production were approximately the same as in July of this year, but stocks at that time were higher, at 50.9 per cent.

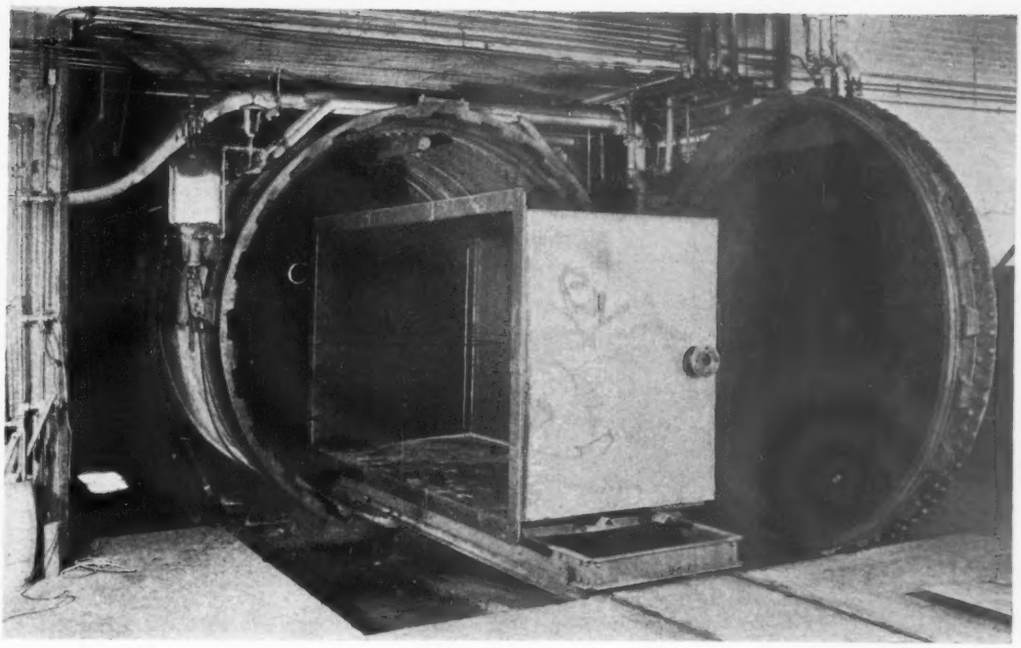
Production
Per cent of capacity

	1931	1930
Aug.	34.9	48.6
July	46.3	50.4
June	40.3	58.8
May	56.6	73.3

Stocks
Per cent of capacity

	1931	1930
Aug.	42.1	50.9
July	42.6	54.9
June	45.8	57.3
May	47.5	54.7





HEATER or vulcanizer unit into which the lined steel tank is placed for several hours to cure or vulcanize the rubber lining. Note the draining plug and fitting on the tank, also rubber lined and coated

Steel Pickling Tanks Are Lined With Rubber and Brick

BY A. H. ALLEN
Associate Editor, STEEL

APPLICATION of steel to the construction of pickling tanks necessitates some means for protecting the steel from the corrosive action of pickling acids. Lead, lumber, bitumastic materials, brick and mortar, and rubber all have been used with varying degrees of success in different localities.

A process recently devised by the B. F. Goodrich Rubber Co., Akron, O., involves the application of a composite rubber sheet to a steel tank by a special vulcanizing process. Differing from other types of rubber linings, the material comprises three layers of rubber—a soft layer, a central, hard layer and another soft layer—the composite thickness being 3/16-inch. Strips of this plied rubber in the uncured condition are cemented firmly to the steel tank, following which the tank is placed in a heater and the rubber is cured or vulcanized, causing it to adhere to the steel with a strength of about 500 pounds per square inch. This is termed the "vulcalock" process.

In the combination of hard and soft rubber for the lining cognizance was taken of the fact that hard rubber is highly resistant to ordinary mineral or vegetable oils, whereas soft rubber absorbs the oil and assists the cushioning properties of the lining. In practically all pickling operations small quantities of oil are encountered at the surface of the pickling acid and an increasing tendency is being noted to make use of the newer organic inhibitors which have practically the same effect on rubber as oil; hence it is necessary to use hard rubber in some form or other for this service. Joints in the rubber

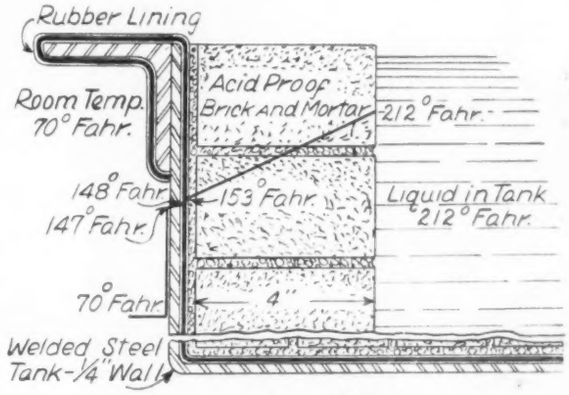
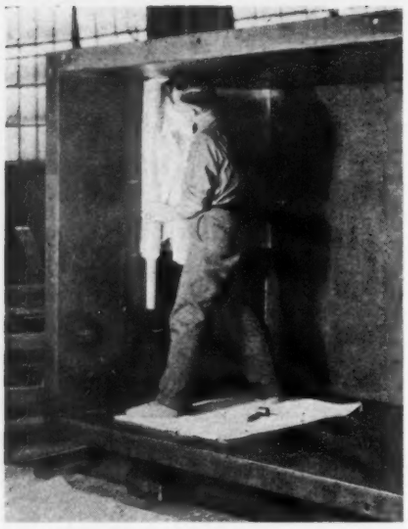


Diagram showing temperature gradient through a rubber-lined steel pickling tank reinforced by a 4-inch course of brick and mortar



Rolling sheets of the uncured composite rubber sheet onto the tank. These sheets are 48 inches wide and are pressed firmly in place by the small roller at the man's feet

sheet constitute another innovation in the construction. The rubber is rolled on the steel by hand in 48-inch widths, and to allow for expansion, overlapping or "triflex" joints are used. In this arrangement, shown in an accompanying illustration, the rubber plies overlap each other, expansion and contraction of the hard rubber being absorbed in these joints. In the temperature range from 32 to 250 degrees Fahr., a typical pickling range encountered in plants in the northern section of the United States, the difference in expansion between a section of hard rubber and steel is 1.941 inches. From this appreciable difference the need for the previously described expansion joint is apparent, if warping and buckling of the rubber lining of the tank are to be avoided.

It is essential in cementing the rubber to the steel that the metal surface be absolutely clean; and sandblasting usually is employed to remove grease and dirt from the inner surface of a tank before applying the cement and rubber sheet.

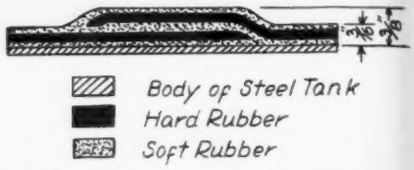
Rubber linings have the inherent disadvantage of having short life at elevated temperatures; 150 degrees Fahr. being about the maximum temperature capable of being withstood with long life. Furthermore, acid concentrations in excess of 50 per cent sulphuric acid have a deleterious effect on the rubber; however, acids used in standard pickling practice generally come well below this concentration.

Sheathing Is Recommended

Since pickling temperatures often run as high as 212 degrees Fahr.—a temperature considerably above the range determined satisfactory for prolonged service in soft rubber—and since rubber linings are subject to physical damage due to dropping heavy castings, etc., or gouging action of materials being pickled, some method of protecting the rubber lining is recommended. Where the pickling solution is at a temperature of 150 degrees Fahr. or less, a 2-inch protective wood sheathing over the rubber, free from nails or bolts except on the top of the tank flanges, prevents damage to the rubber. The need for nails is eliminated by the use of lumber with tongue and groove joints.

For acid solutions up to 212 degrees Fahr. a 4-inch course of acid-proof brick and mortar, built up inside the rubber lining, is recommended. The temperature drop through such brickwork is shown in the diagram on Page 31 which shows that at the face of the rubber lining the temperature has dropped to 153 degrees Fahr., provided proper air circulation can be maintained around the tank. The brick lining, of course, also affords excellent protection against physical damage to the rubber. No brickwork can be perfectly water tight; but any seepage of acid through the brick is kept away from the steel tank by the solid rubber lining.

Temperatures in excess of 212 degrees Fahr. can be handled provided



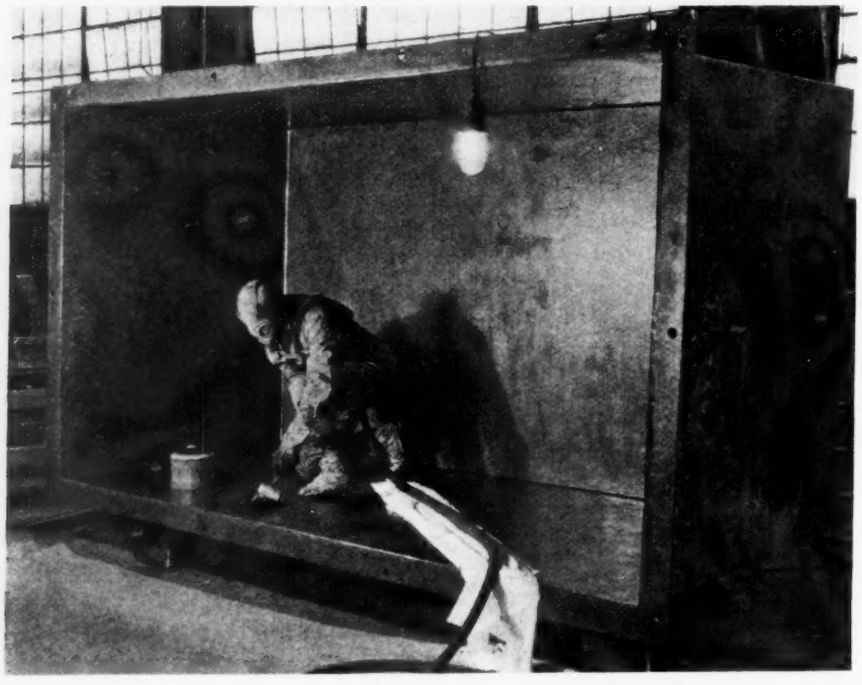
Specially designed "triflex" expansion joint which permits the hard rubber layer to expand and contract within the soft rubber layers

a proportionate increase in thickness of brick is used. This type of construction is exceptionally heavy and must be supported adequately to prevent sagging of tank bottom. It is suggested that the tank be placed on metal, wood or acid brick supports, a construction which elevates the tank so that air may circulate freely over sides and bottom of the tank and thus dissipate heat as rapidly as it radiates from the pickling solution.

Leaks Easily Repaired

Rubber linings, when punctured, can be repaired easily and since the rubber is vulcanized to the steel tank, spread of acid between the steel and rubber, resulting from a leak in the rubber, is prevented. Such leaks are discovered quickly by a small hole which is corroded through the steel at the point where the rubber has failed.

The rubber lining can be applied in the field at the customer's plant and vulcanized in place by the use of boiling water or it can be applied at the plant of the Goodrich company. Several installations at present are either in operation or in process of construction at a number of steel plants. Although the cost of a rubber-lined steel tank with brick sheathing is somewhat higher than wood construction, the designers point out that the increased life of the former more than makes up for its higher cost.



Applying coat of binder or cement to inner surface of steel tank before the rubber sheeting is set in place

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MESTA PATENTED PICKLING MACHINE
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the MESTA PATENTED PICKLING MACHINE does exactly this by reducing Acid Costs 1/3, Labor Costs 1/3, Time required 1/3, over hand methods — and at the same time produces a more thoroughly and uniformly pickled product.

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Mesta

Many Steel Wire Commodities Are Finding Wider Usage

BY H. R. SIMONDS
Associate Editor, STEEL

Part II

A SOMEWHAT surprising new use of wire has developed in the manufacture of mattresses. Steel wire to make mattresses softer seems an anomaly. Hundreds of delicate coil springs placed within the mattress are claimed to give better sleeping properties to a mattress than any other method of construction and demand for wire for these small springs is growing rapidly. Larger sizes of wire are used for bed springs and this demand is also on the increase. Another active use for spring wire is to be found in the production of window shades. In the East there is a wire plant operating almost exclusively on the production of wire for the window shade industry. Watches, clocks, meters, phonographs and many toys use flat spring wire. Nearly all upholstered furniture uses wire for coiled springs and the demand for springs for the cushions of automobiles runs well above 3000 tons a year.

A great variety of small articles made of wire enjoy a fairly constant demand year in and year out. Some of these products are paper clips, pins, needles, hooks and eyes and innumerable small springs and shapes.

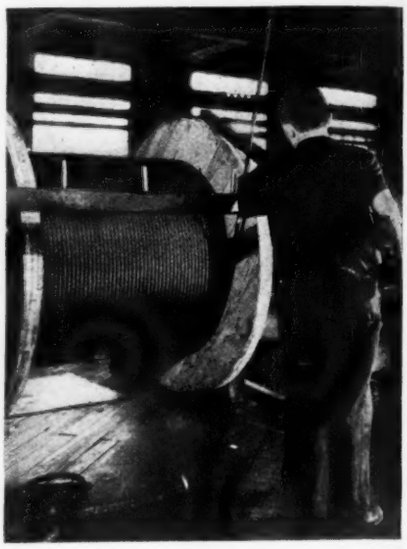
The average man carries a small amount of steel wire with him as part of his apparel. Belt buckles are frequently a wire product. One manufacturer makes these buckles on a wire forming machine which is followed by an automatic welding operation. Belts made entirely of steel wire in the form of a fabric-like spring are coming into vogue and seem to offer a potential outlet for stainless steel spring wire. A small piece of hollow wire, sometimes brass and sometimes steel, is used to hold the lead in mechanical pencils. Shoe eyelets usually are made of hollow steel wire and shoe nails are also made of steel wire. The metal parts of garters and suspenders usually are made of wire, but here brass wire seems to be strongly entrenched although one company has tried alloy steel with success.

Umbrellas, Hats and Flowers

If it is raining, a pound or more of wire will be added to one's personal equipment as parts of an umbrella and if the occasion is a wedding additional steel wire may be found in a silk hat and around a bunch of flowers. This latter use, by the way, calls for a surprisingly large tonnage annually. The wire is known as florist wire and is almost universal in its use for wrapping the stems of cut flowers. Fine covered steel wire is used in large quantities for the manufacture of artificial flowers.

Pianos depend upon steel for their tone and steel wire producers who cater to the piano and musical trade employ acoustical engineers to help them secure the right tonal qualities through steel. Some 2000 tons of high-grade, high-carbon, steel wire go into the production of pianos each year, and in addition to the wire for the strings, many of the small pins and other parts in the pianos are made of wire.

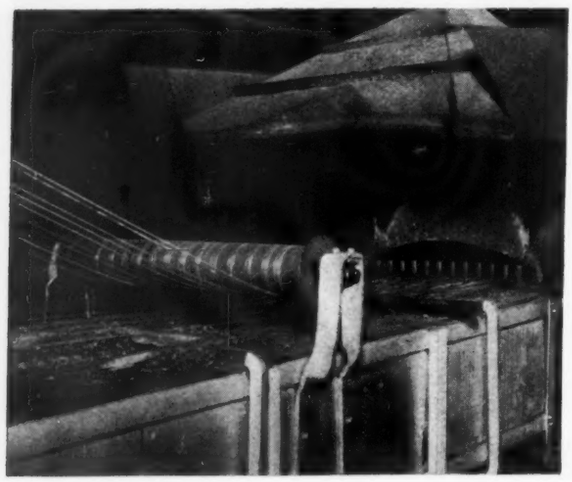
The textile industry is a large user of wire. One of the principal operations in the manufacture of cloth utilizes a fabric known as card clothing. This in effect is a mat composed of a thick forest of small wires, usually from 70,000 to 90,000 per square inch, and held in place by canvas or other firm backing material. The wires, as may be imagined, are of exceedingly small diameter. They are cold drawn from finely tempered steel. The annual consumption of wire for card clothing is estimated in excess of 1500 tons. In addition to this an even larger amount is used for weave wires and heddle wires on clothmaking looms.



Winding steel wire rope on a wooden spool at the plant of the Wickwire Spencer Steel Co.

Because of the convenience of wire as a raw material it is made up into a great number of products which in the finished form have little resemblance to wire. Screws, nuts, bolts and small gears come under this heading. Gears for low priced watches and clocks often are cut off in slices like bread from a sandwich loaf from wire which is drawn to a special gear shaped across section.

Alloy steel wire fabric made up in the form of endless belts is being used successfully as movable hearths in continuous heat treating furnaces. The pieces to be heat treated are placed on the belt and carried through the furnace. Far removed from this application is the use of steel woven mats to prevent rocks flying in blasting. These mats are made up of heavy wire mesh in 12 or 15-foot squares and when blast-



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ENTRANCE to a continuous wire annealing furnace. Twenty-two separate wires are subjected to the action of the heat simultaneously

◆

Courtesy Wickwire Spencer Steel Co.

Why the "chief" and his men prefer this welding wire

There are two principal reasons for the popularity of Roebling Welding Wire. (1) It is absolutely unvarying in quality. (2) It greatly facilitates the production of strong, tough welds.

Any welding engineer, superintendent or foreman, with a large number of welders under his supervision, will readily appreciate the value of a wire such as this. Because every lot of wire—whether a bundle or a carload—is of the same high quality, the quality of the welding itself can be more easily and positively controlled. Furthermore, the welders themselves like this feature of unvarying quality because it makes their job easier. They get a wire that always "works" the same—that keeps them out of trouble.

As for the strong, tough welds produced with Roebling Welding Wire—why not judge them to your own satisfaction? Write our nearest office for samples of Roebling Wire and put it through the most critical of tests. Roebling Welding Wire is made in gas and electric types.

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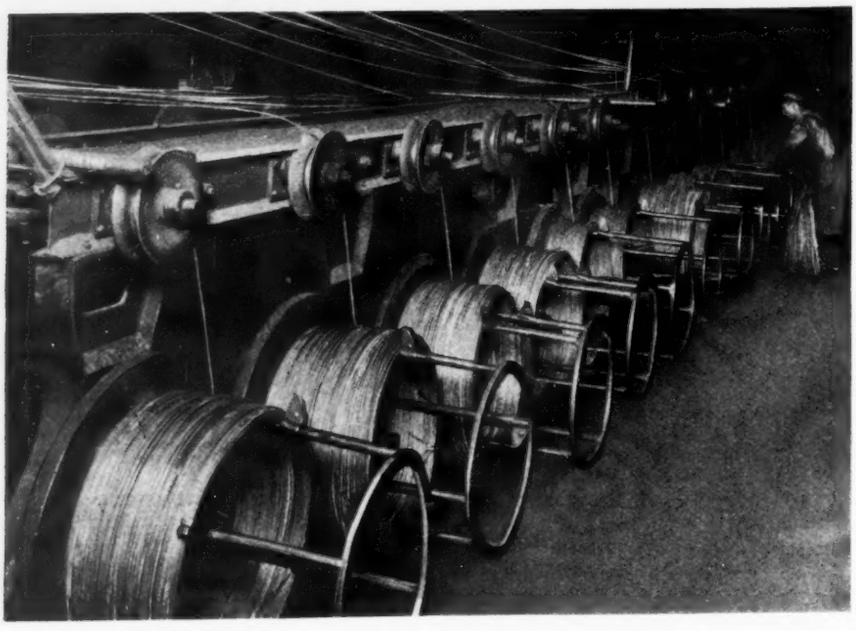
ROEBLING WELDING WIRE

ing is to be done in congested districts as, for instance, for subways in New York, half a dozen of these heavy wire mats placed over the point of explosion, effectively prevent the flying of rocks. The mats are used over and over again and are much easier to handle than heavy particularly in various marine in-

The use of wire for suspension bridges is perhaps one of the best known applications. The slender graceful curves of a suspension bridge are associated with steel wire in the public mind. In the Hudson River bridge now nearing completion at New York the four supporting cables are made up of thousands of



Courtesy Wickwire Spencer Steel Co.

Wire coming from heat treating furnace is wound into coils preparatory to further treatment

small parallel steel wires about 1/5-inch in diameter. The cables are 36 inches in diameter and each contains over 26,000 of the small wires. The weight of wire in the main cables of this single bridge is 28,300 tons. In addition to this some 35 miles of 2⅞-inch diameter wire rope was used for suspending the bridge floor from the main cables.

The electrification of railroads, progressing on an increasing scale, calls for a heavy tonnage of steel wire for guys and trolley supports. These encouraging signs for the wire industry are not without some compensating retrenchment, however.

The future of the wire nail is precarious. Many signs point to a declining demand. The increased use of structural steel in building construction is curtailing the use of nails. Even in the case of residences fewer nails are being used. This is due partly to the use of wall board in place of lath, the use of metal window frames, metal lath and the use of many special forms of joist hangers and fasteners. A further reduction in the use of nails is brought about by a tendency to use steel and other types of construction in place of wood in fields outside of building. The wooden railway coach is almost a thing of the past. Wooden roller coasters and other amusement devices are prohibited by law in many states. On the farm the wooden silo has given away to concrete and steel and in the furniture industry steel and aluminum are making deep inroads. All this means fewer nails.

The wire nail is a French invention and was originally headless. With an upset head it was introduced into America in small sizes in 1807. The first wire nails made in this country were made by Norton & Bremner, New York, in 1851. In 1876 William Hassall who had bought the Norton & Bremner nail business had a notable display of his products at the centennial exhibition in Philadelphia. Credit for the chief interest in the development of the nail industry is given to the Kentucky Wire Nail Works, later known as the American Wire Nail Co. and purchased in 1899 by the American Steel & Wire Co.

Market Undergoes Change

Like nails, fence wire is also on the decline. This is probably due to the consolidation of small farms and to specialization in the farming industry which means that many farmers have given up stock raising and with it the necessity for enclosing fields with fences. In hard times such as the present, the use of barb wire usually increases because it is cheaper than various kinds of woven fencing and therefore is used where a woven fence would be used in better times.

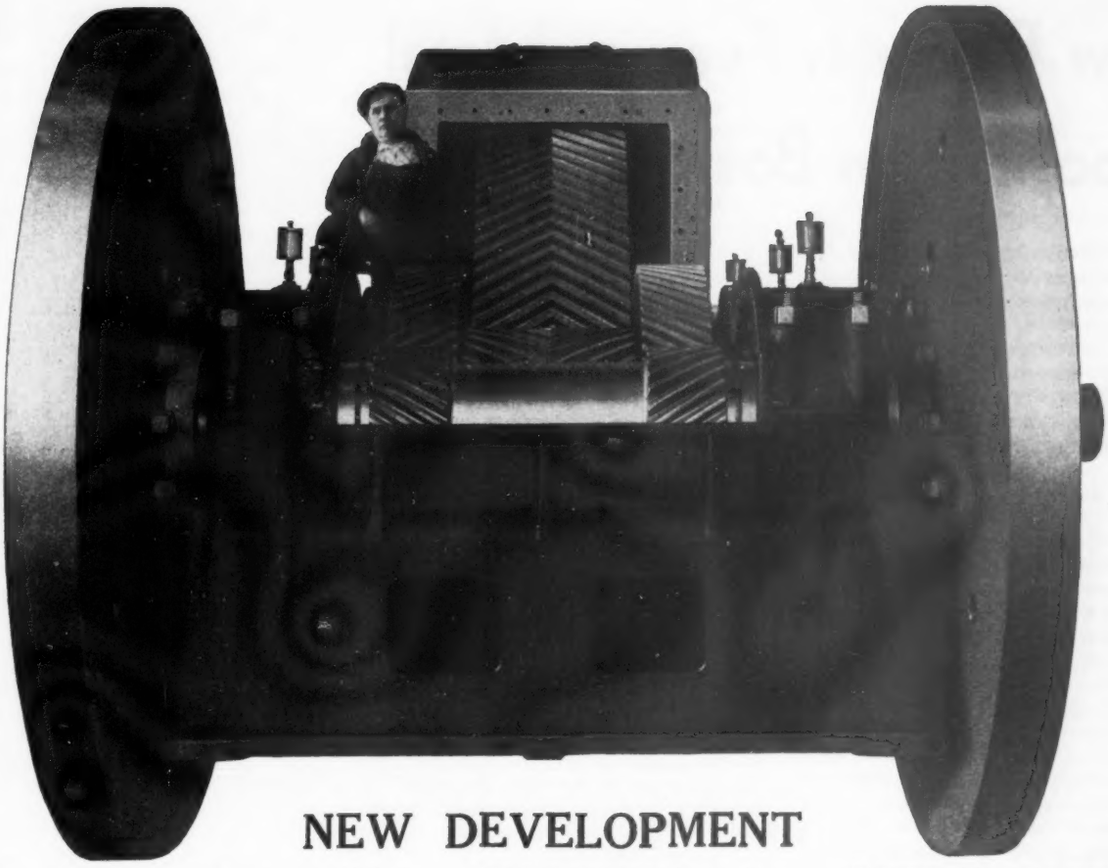
The advent of the automobile with its decline in number of horses has brought with it a corresponding decline in wire used for hay bale ties as well as wire for harness parts and for horse shoe nails.

Changes in style have replaced carpets with rugs in a majority of American homes and this together with other changes has cut the demand for tacks in half during the past ten years. Nevertheless, a heavy tonnage of steel is represented even in the present demand. The tacks are made either from strip steel or from tack wire and a conservative estimate places the annual demand for tack wire at 200,000 tons. The demand for wire hoops such as used in the cooperage industry has fallen off sharply partly due to a change to flat strip and partly due to prohibition and other influences which have diminished the demand for barrels. Wood screws have nearly held their own during the development of the last few years although at present the demand is off with most other commodities due to the slack season. The automobile industry accounts for a large tonnage of wood screws made from bright steel wire and the use of alloy steel screws of the rust resistant type is increasing, particularly in various marine installations.

Rust-Resisting Iron Tin Plate Is Developed

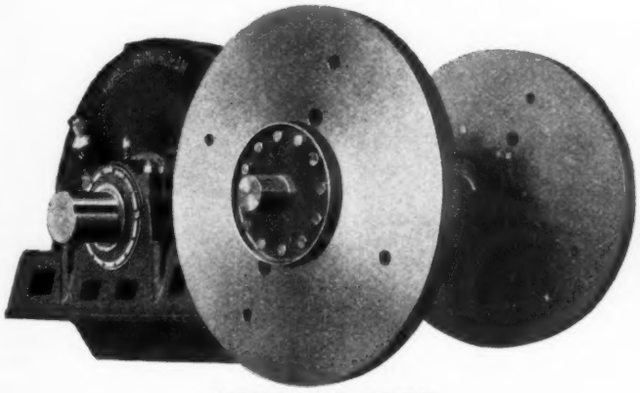
Republic Steel Corp. Youngstown, O. is announcing a new product which has been developed by its research division—Toncan iron tin plate, which will supply those branches of industry particularly identified with canning and food products with a rust-resisting tin plate. Possessing the same base analysis as Toncan copper molybdenum iron, the metal is claimed to be the only tin plate with a rust resisting base on the market today. It can be supplied in all base weights and sizes, and is especially adapted for cans for packing strawberries, apple butter and other fruits and fruit products of acid nature.

A few other uses are: Containers for chemicals, bottle caps and crowns, lanterns, gas meters, oyster shipping containers, lithographing plates for signs, curtain rods, furnace heat pipes, bread and cake pans, soundproof ceilings, stove backs, drip pans, lye cans and various architectural applications—gutters, flashing, conductor pipe, etc.



NEW DEVELOPMENT IN ROLLING MILL ENGINEERING INTRODUCED BY FARREL

During the past five years much progress has been made in the design, manufacture and application of Anti-Friction bearings. The application of this type of bearing to herringbone gears has presented many problems, and by their successful solution the Farrel-Birmingham Company has been able to pioneer yet another outstanding development in Rolling Mill Engineering, represented by the drive illustrated above.



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New Products Feature Metal Exposition in Boston

NEW steels and alloys, new and improved processes and new equipment featured the displays of exhibitors in the Thirteenth National Metal exposition held in Commonwealth Pier, Boston, Sept. 21-25. These developments were perhaps more numerous than in metal shows of recent years, but this was not unexpected because periods of depression always stimulate research.

Attendance at the Boston show was somewhat smaller than at previous shows, but interest did not suffer to the same degree. Exhibitors totaled approximately 150, as compared with 175 one year ago in Chicago. The exhibit space with some 60,000 square feet, on the other hand, registered a substantial increase; it is to be remembered that the 1930 space was restricted.

Corrosion-resisting steels assumed a prominent position in the Boston show, with nearly 20 manufacturers displaying the material in sheet, strip, bar and wire form as well as in hundreds of fabricated products. The brightness and attractiveness of these exhibits created a wide appeal.

Veneered Metal Shown

Two manufacturers showed recently announced combination steels consisting of 80 to 90 per cent open-hearth steel to which is veneered by a special welding process 10 to 20 per cent of rust-resisting steel. This material is available in sheet and strip form suitable for making automobile lamps, hub caps, gas and radiator caps, bumpers, molding, tubing, hardware trim and spouting. Rust-resisting veneer of varying compositions can be applied and the backing steel can be supplied in carbon contents up to 1.10 per cent.

This combination steel can be fabricated by welding. Display of abused parts indicated that the bond is of high strength and is not disturbed even under acute distress. The veneer can be applied to one or both sides of the mild steel base.

Heat-resisting products also were widely shown, chiefly of the chrome-nickel composition. Some rolled forms were to be seen, but castings constituted the larger group, the products being for pots, containers, furnace hearths, rails, chains, etc.

A manufacturer of shear knives, die blocks, forgings and piston rods, introduced a new razor blade made from alloy steel which is a modification of that used in shear knives. The steel, which is said to afford a keen cutting edge, is produced in the electric induction furnace.

Cemented tantalum carbide for cutting tools and dies, developed since last year's show, attracted attention. This new material is an outgrowth of research in the manufacture of tungsten carbide placed on the market several years ago. For certain work it is superior to tantalum carbide, for other types of work it is inferior. Introduction of these new materials has been responsible for revolutionary improvements in tool steels in the last five years.

Atmosphere Control Emphasized

Bright annealing equipment was shown with one furnace manufacturer operating an electric conveyor furnace designed for this purpose. It utilized a special atmosphere; consequently, operated in conjunction with the unit, were an ammonia dissociator for providing the atmosphere and a nitrogen producer for burning dissociated ammonia.

Many furnaces this year were equipped with atmospheric control to prevent scaling, carburizing and burning of work in the furnace; this control being applied to both gas-fired and electric units. These furnaces find their principal use in the heat treatment of high-speed steel tools. Positive control of furnace atmosphere is claimed to give remarkable results in controlling dimensional changes.

Several manufacturers of both gas and electric furnaces showed units for nitriding and carburizing. In these cases the proper atmosphere is maintained in the furnace chamber by introducing measured gas or a liquid which gasifies with the heat. Since the nitriding process was first introduced, there has been a definite swing to the gaseous atmosphere process for carburizing or hardening of steel; thus it is not surprising that manufacturers have developed furnaces for this work.

Continuous Carburizing

A manufacturer, concentrating on gas-fired units, described a continuous carburzing furnace, a modification of a continuous nitriding furnace, in which the work is loaded upon the conveyor and automatically passes into the chamber through a special gas seal without disturbing the gaseous atmosphere in the chamber. Similarly, the work emerges from the furnace through a second seal of the same type as the entrance seal.

One electric furnace shown, of the small box type, was equipped with an electromagnetic winding which makes it possible to determine the Ac_3 point of the steel within the furnace.

More pronounced than ever was the accurate control of furnace temperatures, this being the result of work of furnace manufacturers and control equipment manufacturers. With the development of recent years and more particularly the last year, the human element is almost completely removed from furnace control.

Mechanisms of various types keep constant check on furnace temperatures and automatically regulate fuel supply and fuel and air proportions without human aid. Not only have motor-operated valves and fuel proportioners been made more accurate, but marked improvements have been incorporated in pyrometers.

Every manufacturer of pyrometers and recording instruments had something new to offer. Perhaps the principal achievement has come in the potentiometer-type pyrometers with improved balancing mechanisms which provide speedier recording, micrometer sensitivity and freedom from adjustment. These instruments also feature self standardization.

Controllers Are Improved

Among controllers was a new three-position type for continuous furnaces in which sudden temperature fluctuations occur and in which the average load changes considerably. Another interesting unit was an improved two-motor balancing controller particularly adapted to large tunnel kilns and similar installations.

Notable improvements also were to be found in instruments for metallurgical and physical testing and microscopic examination. Two manufacturers showed X-ray equipment. One new equipment produces diffraction patterns for the determination of the effect of working of metals and heat treatments.

A new universal testing machine with a new straining and weighing system attracted considerable attention. The manufacturer of this equipment also demonstrated what was said to be the largest static-dynamic balancing machine ever shown in an exhibition in this country. Throughout the week it was used to balance heavy crankshafts.

Likewise new at the show was a dilatometer for critical temperature determination and coefficient of expansion combined with a laboratory furnace for heating. This equipment allows the steel to be quenched in the instrument, thereby obtaining the dilation and temperature changes during the quench. It is also said

capable of determining the proper rates of heating to obtain the minimum amount of shape change in the final work, and in addition, is adapted for studying quenching mediums.

An acid star return pickling machine was in operation during the week cleaning forgings. This machine was a complete unit and has been designed to take the forgings as they come from the trimming presses and to descale them with combination of the acid and star return action. After descaling, the machine neutralizes the forgings, washes and dries them. A feature of the pickling tank was the rubber lining, recently developed and now attracting attention.

Progress in Refractories

A wide line of refractory materials was displayed by some half dozen manufacturers, these products consisting of brick, special shapes and plastic cements. Recent years have witnessed notable improvements in refractories for metallurgical uses.

A new chrome plastic cement was shown for the first time by one refractories maker. This cement remains in suspension when applied to brick and is easily worked; in other words, its moisture is not rapidly absorbed by the brick. The material is air hardening and because of its nature joints can be made comparatively thin; after fusion it shows exceedingly high strength. Ordinary laboratory tests thus far undertaken have failed to determine the ultimate fusion point.

New machine tool equipment included a vertical punch and die shaper by which punches in the most complicated shapes can be finished by a shaping operation. It is claimed that it is possible to make one-piece punches with practical elimination of hand work.

Steelmakers visiting the exposition were interested in a model of a new type of stripper for big-end-up ingot production designed especially for nonsink-head ingots. The equipment consists of a special ingot car, an ingot mold hold-down yoke and a device for lifting the ingot in the mold and holding it there during cooling.

About 15 minutes after the molds have been poured, a period depending upon the size of ingots, the car is pushed under the stripper. The hold-down device is lowered on the mold with only sufficient pressure exerted to hold the mold on the car. Next a piston of relatively large diameter raises from floor level and exerts pressure on a plunger in the mold bottom and passing through the car floor. Further pressure on the piston strips the ingot from the mold, raises it a few inches and locks it.

The effect of this operation is to provide an air gap between the ingot and ingot mold which promotes more rapid cooling. In addition to the saving in cooling time, an added economy is claimed in considerably increased mold life. The plunger in the bottom of the mold is so designed that when in the raised position air is permitted to pass freely through the plunger opening and upward around the walls of the ingot. As a matter of fact, the rapidly cooling ingot creates a chimney action which causes air to be drawn in at the bottom and to rise between the ingot and mold.

New Welding Equipment

Considerable new welding equipment was displayed in the large area devoted to welding and cutting. In addition to a large variety of welded products assembled to show arvantages of various processes, manufacturers demonstrated new types of rods and wire, electrode holders, torches, machines, etc.

Machines for mechanical welding of tubes from 1¼ to 4 inches in diameter with wall thickness up to 3/16-inch, using the oxyacetylene torch, drew interest. One such machine featured overhung mounting of the rolls, facilitating quick changes of the roll equipment, and water cooling of bearings exposed to heat.

Trend Toward Automaticity

A special device for holding the acetylene welding torch and welding rod while making joints in pipe lines, was exhibited by another manufacturer. This equipment, intended principally for field use, is quickly adjustable for pipe diameter and is expected to reduce the time required to complete joints. The operator has only to guide the device over the joint at the proper speed, the welding rod melting and feeding down automatically.

Automatic shape cutters using oxyacetylene torches were operated in several booths and proved fascinating. These machines, operating on automatic pantograph principle and using master templets, reproduced these shapes by cutting them from steel plates. On some units it was possible to make up to four reproductions at one time. These machines are equipped with remote control apparatus which enables the operator to light each torch and turn on the oxygen cutting jets.

Several new electric welding machines were shown, including a line of spot welders in various capacities. Principal feature in electric welding equipment was refinement in control of welding currents. Shown but not operating was a machine for welding the seams in steel battledeck floor construction. This unit, compactly built and having automatic features, is mounted on wheels and is rolled over the seam at the proper speed to effect the weld.

Visitors to the 1931 National Metal exposition were impressed with the number of new products on display

SNAGGING—

Snagging may mean removing superfluous metal from a gigantic casting of toughest steel. It may mean smoothing up a tiny article of cast iron or some nonferrous metal. It may mean anything in between. Conditions in each case are different.

And to meet each different condition there is a suitable Norton Grinding Wheel—a wheel that is right in abrasive, bond, grain, grade and structure—a wheel that will remove maximum metal at minimum cost.

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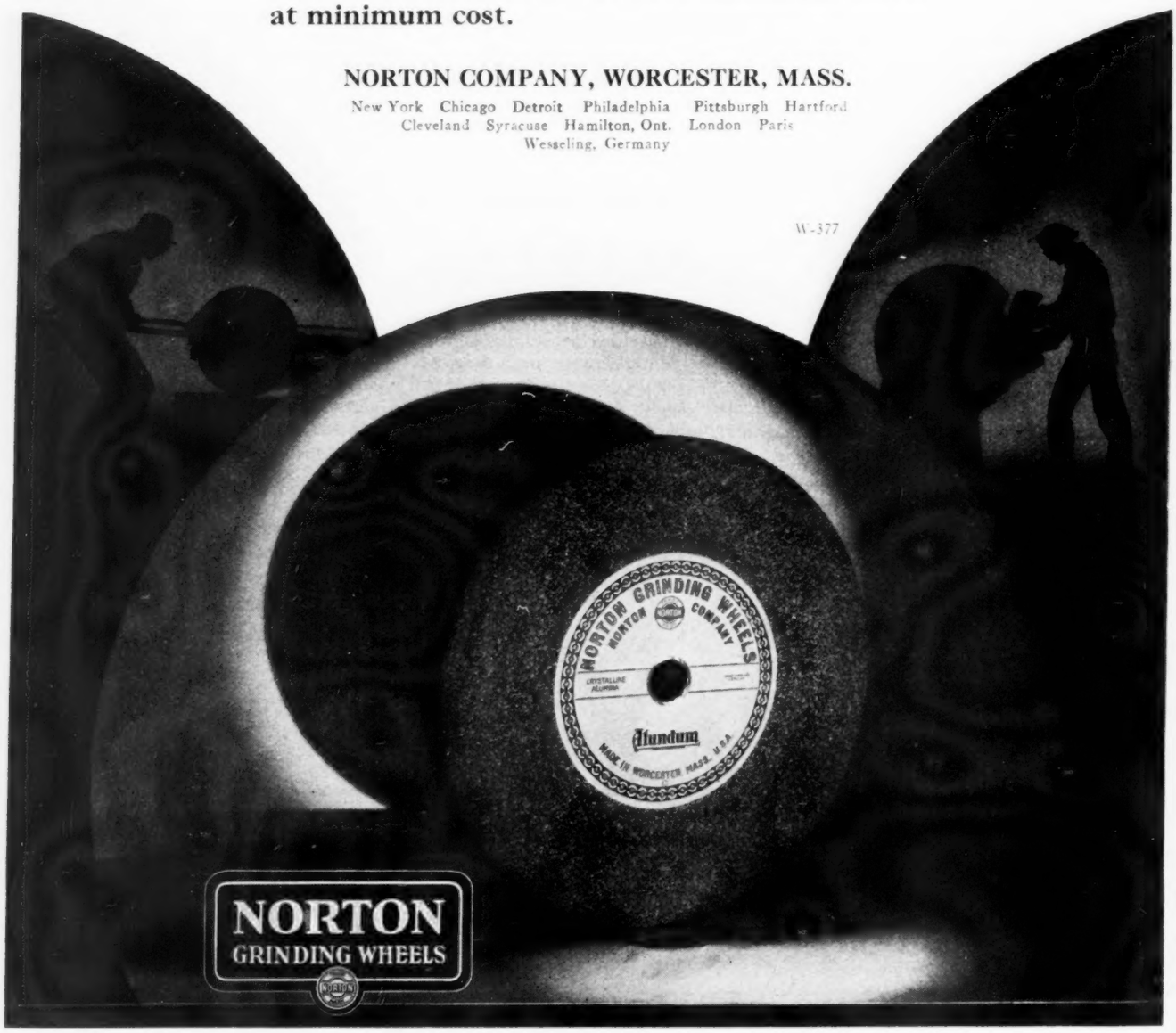


Sheet Drawing Performance Difficult To Guarantee

CONSIDERABLE difference of opinion exists as to whether suitable physical specifications can be set up for sheet steels for deep drawing operations. Sheets are purchased widely on this basis, but the true test of quality is found in the performance of the steel under the die. The tendency, therefore, is toward closer co-operation between the sheet manufacturer and purchaser to find material which will withstand press requirements best.

In an effort to evaluate the drawing quality of extra deep drawing sheets, Thomas Dockray, Eastern Rolling Mill Co., Baltimore, recently conducted an investigation and he reported his results at the sheet steel session during the American Society for Steel Treating convention in Boston, Sept. 22. His conclusion was that while it is possible to guarantee the manufacture of sheets to definite physical specifications, it is not possible to guarantee drawing performance.

Must Study Age Hardening

Age hardening of sheets appears to be the most difficult factor to determine. According to Mr. Dockray, age hardening is caused by something known or unknown in the steel, and future research must be directed into this subject. Some steels are practically free from the effect; others for no apparent reason are affected by it and the degree of effect is uncertain. The most reliable index, he said, is gained from the Erichsen and Rockwell tests, but even these tests show variation with aging.

For thin strip steel, on the other hand, H. T. Morton and I. A. Rummler, metallurgist and assistant metallurgist, respectively, Hoover Steel Ball Co., Ann Arbor, Mich., contend that it is possible to test and write specifications for deep drawing purposes such as ball and roller bearing retainers, bands, etc. They showed that the same kind of tests apply for hot and cold-rolled strips of 0.062-inch thickness and under, but the limits are slightly different.

This steel is of the open-hearth type; is purchased in strips from 0.025 to 0.062-inch thick and in width from 1½ to 5 inches; corresponds to S. A. E. 1010; and has the following analysis: Carbon, 0.05-0.15; manganese, 0.30-0.60; phosphorus under 0.045; sulphur under 0.055 per cent.

The tests are of special interest to the small user of this type of material who is not equipped with an Erichsen or similar cup-forming testing machine and must rely on more simple methods of testing. The authors found the following specifications met the requirements for cold-rolled steel: Rockwell B hardness—35 to 55; Rockwell hardness variation—5 points maximum within a strip; 180-degree bend flattened out—no crack, breaks or roughening; structure—free from grain growth; surface—clean and bright; size tolerance—standard mill limits, not exceeding 0.002-inch within a strip.

For hot-rolled steel, the following specifications were set up: Rockwell B hardness—45 to 62; 180-degree bend test—no cracks, breaks or roughening; structure—free from grain growth; surface—pickled and oiled; size tolerance—plus or minus 0.004-inch.

Summarizing their investigations, the authors stated: Definite limits of Rockwell hardness must be adopted for uniformity of size of formed parts; bend tests give accurate information on the drawing quality and structure of this steel; each strip must be uniform across its surface for hardness and thickness to obtain a smooth edge on formed parts; and inspection of small percentages of shipments for surface conditions insures uniformity of finished parts.

Discuss Plastic Drawing

Extreme plastic movement or rearrangement of metal cold is illustrated in drawing round shells and principles developed there may be applied also to rectangular and irregular shapes, according to E. V. Crane, staff engineer, E. W. Bliss Co., Brooklyn, N. Y., who discussed in considerable detail the plastic drawing of sheet steel into shapes.

The primary stress is the tensile stress in the shell wall which rarely is in the necking range and often below the yield point. The resultant compressive stress in the flange area during drawing must always exceed the annealed yield point and often rises to necking range stresses well above the nominal ultimate tensile strength. The extensive metal movement in this area causes strain hardening of the crystal structure at a predictable rate.

Press operations and drawing operations in particular, according to Mr. Crane, require development of plastic working theory and physical properties which describe the metal above its annealed elastic limit. Such data assist in explaining the troubles met with and the limitations upon drawing operations.

Stretcher strains on the surfaces of metal after the draw has been completed constitute one of the greatest difficulties in the forming of sheet and strip steel by the deep drawing process. In an attempt to throw more light on this subject, Joseph Winlock and A. E. Lavergne, Edward G. Budd Mfg. Co., Philadelphia, recently completed some experiments which, although preliminary, gave some interesting results.

Tensile specimens were machined from strip steel containing: Carbon, 0.06; manganese, 0.36; phosphorus under 0.015; and sulphur, 0.030 per cent. Specimens were divided into two lots; one lot as cut was designated as box annealed and the other was heated to above the Ac_3 point and designated as normalized. Percentage of elongation in 8 inches in both groups when tested in the usual manner was about the same, 31 per cent. Both groups then were pulled at various rates from 2 to 252 inches per minute.

Try To Avoid Premature Fracture

By pulling the box-annealed specimens slower than 19 inches per minute, permanent deformation took place at a rate slow enough to produce sufficient work strengthening so that all parts of the specimen were forced to elongate. But when a higher rate of deformation was employed there was not time enough for sufficient work strengthening to take place. As a result, premature fracture occurred.

The time necessary to prevent premature fracture appears to vary according to the heat treatment, and other conditions existing in the steel. This is shown by the fact that the specimens heated above the Ac_3 point could be pulled at any rate between 2 and 252 inches per minute without premature fracturing.

The time necessary for sufficient work strengthening to take place to prevent premature fracture from occurring seems to decrease as the extension increases. This was shown by the fact that the box annealed specimens when pulled first with a slow rate of deformation followed by a faster rate elongated without fracturing prematurely.

It would seem to the authors then that low-carbon steel is best suited for deep drawing purposes when it is in the semiplastic condition, since it can then be deformed at a faster rate without premature fracture taking place, and no stretcher strains will form.

The primary function of a lubricant in deep drawing operations is to prevent metal-to-metal contact between the work piece and the dies, and also to decrease the sliding friction. The degree to which a lubricant comes up to these require-

ments is a measure of its efficiency and value. An ideal lubricant must possess the following characteristics in the order of their importance: Film strength, oiliness, adhesiveness and spreading, ease of cleansing, noncorrosiveness, stability and uniformity, physiological effect, odor, resistance to climatic conditions and economy.

Until recently, each fabricator developed his own lubricants by the expensive cut-and-try method, according to Maurice Reswick, chief engineer, Pennsylvania Lubricating Co., Pittsburgh. As the development of an efficient lubricant depends on the science of chemistry and the art of compounding as much as it does on a knowledge of the operating problems involved in the drawing of sheet steel, it is obvious, according to Mr. Reswick, that the problem can be solved best by mutual effort and by the technical staff of manufacturers who make a specialty of developing special lubricants for particular jobs.

Principal ingredients of a lubricant are tallow, mineral oil, water and fillers. Within recent years startling progress has been made in the field of general lubrication by developing oils and greases containing lead oleate, and the author stated that experiments now are in progress with this ingredient in drawing compounds. It is claimed that lead oleate sustains heavier loads and that it obtains protection over six times greater than with mineral oil.

Seek Polishing Abrasive with Limited Range of Particle Size

THE problem of securing an abrasive with a limited range of particle size for metallographic polishing was discussed in detail by J. L. Rodda, investigator, metal section, research division, New Jersey Zinc Co., Palmerton, Pa., at the fall meeting of the iron and steel division of the American Institute of Mining and Metallurgical Engineers in Boston, Sept. 23. All metallographers have recognized the damage that can be done to a polished surface by a piece of grit, especially if one of the softer metals, such as zinc or aluminum, is being polished. Yet, Mr. Rodda declared, abrasives for this work have not been fully satisfactory.

Particles of Varying Sizes

Commercial abrasives, even when recommended for metallographic polishing, are made up of particles of varying sizes. One such abrasive contains some particles so fine that they remain in suspension for days and others so coarse that they settle at the rate of 3 inches per minute. It is evident that the coarsest particles are more than 100 times the diameter of the smaller ones, or more than 1,000,000 times the volume. Mr. Rodda declared, evidence of the hopelessness of avoiding scratches under these conditions.

Stating the elutriator is too slow for the grading of abrasives and required too delicate control for the range of sizes desired, the speaker recommended the method of stirring the abrasive in water, allowing it to settle for a given time and then drawing a measured depth off the top of the suspension. The largest particle in a given portion is then determined by Stokes' law which, he pointed out, is based on the assumption that each particle is free to fall by itself; that there is no flocculation or attachment of any particle to its neighbor.

The first necessary step was to decide on some standard for the coarsest and finest abrasives to be obtained. Mr. Rodda in the experiments he presented, made his selection for zinc and its alloys. However,, he said, each metallographer must decide for himself the range of sizes best suited to his work, since metals vary greatly in hardness and susceptibility to scratching.

Age-hardening of austenite was the subject of comment by F. R. Hensel, Westinghouse Electric & Mfg. Co., Pittsburgh, who described exhaustive experiments, which showed that the addition of 3 to 5 per cent titanium or molybdenum above 13 per cent to a nickel-manganese austenitic base alloy made it possible to obtain marked precipitation hardening.

Remain Nonmagnetic

Both the titanium and the molybdenum age-hardened austenitic alloys remained nonmagnetic throughout heat and mechanical treatments. Aging in the titanium series was accompanied by a pronounced shrinkage amounting in one case to approximately 0.18 per cent in length.

The electrical resistivity of the titanium series, Mr. Hensel observed, showed an abnormal change in that it first increased and then decreased. He also said that titanium alloys, after aging at 600 degrees Cent, presented a troostitic appearance, and that the X-ray analysis of titanium alloys showed that the lattice constant changed during aging.

The tensile and elastic properties of the titanium alloys, he said, were increased considerably by the precipitation hardening. In one case the elastic limit was raised from 16,500 to 70,000 pounds per square inch, with a yield point of about 107,000 pounds per square inch. Although this increase was connected with a material loss of ductility, the final of the latter (13.5 per cent elongation) was high enough to make the material interesting from the engineering standpoint.

Low Aging Temperature

The ductility of the titanium alloys, the speaker continued, was increased in one case from 5.9 to 21.7 per cent by aging at 550 degrees Cent. instead of at 600 degrees. Lower aging temperatures, therefore, give the best tensile properties with such alloys. he declared.

The changes of the tensile properties of the molybdenum series during aging are not favorable, Mr. Hensel said. The elastic limit is lowered and the alloys lose their ductility almost completely without corresponding increase being shown in ultimate strength.

Will Conduct Evening Course in Welding

Plans have been completed for an evening school course on the subject of metallurgy of welding, by the St. Louis Welding society, St. Louis. The course has been arranged with the assistance of E. H. Sager of the department of mechanical engineering of Washington university and E. C. Meinholtz, assistant chief of tests for the Missouri Pacific railroad. The course will include discussion of the constituents and grain structure of metals, composition of welding wire. effect of welding upon the various properties of metals, weldability of metals, expansion and contraction of welded sections, and physical tests of welded sections. B. N. Osmin, 4620 Delmar boulevard, St. Louis, is secretary-treasurer of the St. Louis Welding society.

To Address Steel Treaters

George A. Richardson, Bethlehem Steel Co., Bethlehem, Pa., will address the members of the Phladielphia chapter of the American Society for Steel Treating, Oct. 2, on the subject of "The Manufacture of Structural Shapes and Related Products." He will illustrate his remarks with motion pictures. The meeting will be held at Temple university, Conwell hall, Broad and Montgomery avenues.

Machine Welding of Wire Mesh Progresses Steadily

INCREASING demand for metal fabric especially for wire mesh used in highway construction, has resulted in steady progress in electric welding of wire and rods by machine. Nature of the material plays an important part in successful machine welding of fabric, high carbon and scale found in some old or re-rolled material operating against most successful welding.

Fabric 102 inches and more in width is welded by some of the larger and recently designed machines, one having 31 welding transformers and welding units, taking a maximum of as many longitudinal wires with minimum spacing of two inches. Spacing may be increased in steps of ½-inch, each welding unit and transformer being adjustable; minimum spacing of transverse wires is 2 inches and this may be varied in steps of 1 inch up to 16, with the exception of 13-inch and 15-inch which are not obtainable because of the design of the double pawl and ratchet. These 13 and 15-inch spacings, however, are not generally encountered.

Scale Presents Problem

Pointing out the importance of clean wire and rods of low carbon content, W. T. Ober, Thomson-Gibb Electric Welding Co., told members of the American Welding society at its fall meeting during the National Metal Congress in Boston Sept. 23 that scale and carbon content presented problems, these interfering with the passage of low voltage, high amperage welding current. On material with scale or high carbon, additional pressure must be exerted and the weld made in a fraction of a second. Little material outside the immediate welded zone becomes heated and the welded joint cools rapidly in the air. This tends to produce brittleness.

Manufacturers of welded fabric generally accept the view that the total thickness of the two wires or rods at the completion of the weld should not be less than approximately two-thirds of the total thickness of the unwelded wires if the maximum strength is to be obtained.

Bridge-type electrodes have been employed with success in the welding of scaly high-carbon wires. In this process the electrodes do not contact the wire directly at the point to be welded, but rather at two points on each wire approximately one and one half diameters away from the center line of the weld. This heats not only the weld point, but also the material a greater distance from that point, allowing sufficient heat to remain in the weld for a longer period, partially annealing the metal. Mesh welded by this method has withstood tests to which it is submitted in actual operation.

Total transformer capacity of the 102-inch machine is approximately 360 kilovolt amperes and electrical connections are so arranged that the 31 transformers are divided into a three-phase circuit, two of ten and the third of 11. This gives a balanced load and is maintained regardless of the number of transformers being used on any type of fabric. One motor is used in driving all mechanical parts.

This machine will weld fabric with longitudinal wires from approximately No. 14 to No. 0 gage and transverse wires up to ¼-inch in diameter. Another machine will weld mesh up to 124 inches in width, handling longitudinal wires up to ⅜-inch in diameter and down to a minimum diameter of 0.135-inch while transverse wires up to 5/16-inch are handled. This larger machine is equipped with 32 transformers and has a rated transformer capacity of 750 kilovolt-amperes. The unit automatically feeds and straightens longitudinal wires from reels and feeds, straightens and cuts tranverse wires up to ¼-inch in diameter. When larger transverse wires are used an automatic magazine feed is employed, the magazine receiving pre-cut and pre-straightened rods.

Speeds are important and have been developed to a high degree on the most modern types of automatic mesh welders. These machines have speeds of 30 or even 35 cycles a minute which means that 30 or 35 transverse wires are welded to all longitudinal wires per minute. These speeds have been attained on 9 and 10-inch mesh for road reinforcement. Tonnage on any given volume naturally depends upon the number of longitudinal wires to be welded and also the spacing of transverse wires, independent of the speed of the machine and the welding units.

Spacing Governs Speed

Longitudinal wires generally being larger in diameter than the transverse rods, the more longitudinal wires used and within reasonable limits, the greater the spacing of the transverse wires, the greater the tonnage obtained for a given speed. High-speed operation may be used readily with 12-inch spacing.

Some machines have been equipped with an automatic slitting device which converts wide fabric into narower widths as it passes through the final phase of the operation.

Basic principles of resistance welding of fabric as embodied in the earlier and first machines remain much the same, although details in improvement has been steady, in keeping with the gain in the demand for fabric. The Clinton Wire Cloth Co., Clinton, Mass., produced the first automatic welding machine to weld fabric, using the patents of J. C. Perry. Before that, the process used was a form of weaving. The first machine was made for wire fencing and light reinforcing.

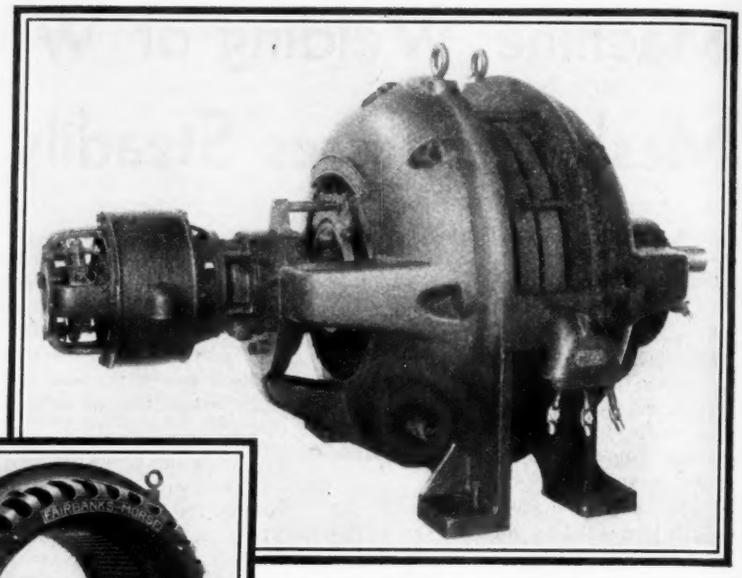
New Designs in Heating Furnaces To Revolutionize Forging Methods?

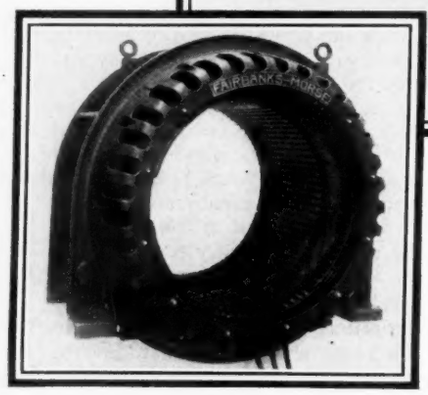
METHODS of forging steel are about due for an upheaval, according to E. F. Davis, metallurgist, Warner Gear Co., Muncie, Ind., speaking at a technical session of the Society of Automotive Engineers, during the National Metal Congress in Boston, Sept. 23. If the problem of scale can be solved, and he said that he had reasons for believing it could be, forgings can be made easily within a few thousandths of an inch of finished dimensions.

Heating furnaces can be designed to solve this problem, making the pickling, tumbling and sandblasting operations unnecessary, but the equipment, he said, will be revolutionary when considered in the light of heating furnaces still prevalent in the forging industry.

Discussing economies of modern heating installations, Mr. Davis pointed to savings resulting from the extensive elimination of the human element, making not only for a reduced payroll but a better product. He said he had seen carburizing costs reduced during the past 10 years from 10 cents to 9 mills per pound. He discussed the fuel saving afforded by continuous annealing, but said that more important economies effected by this equipment were to be found in faster machining

Superiority





75 hp. 1800 r.p.m. bracket type synchronous motor with direct-connected exciter. F-M Synchronous Motors are available also in pedestal and engine types.

Stator core of a 125 hp., 900 r.p.m. synchronous motor. F-M Synchronous Motors are available in a complete range of sizes from 20 to 10,000 hp. and from 100 r.p.m. to 1800 r.p.m.

Nutless, Boltless, Threadless Stator Construction in Synchronous Motors Results in Extra Years of Trouble-Free Service

Mechanical Features

Laminations evenly stacked on threadless stacking pins and permanently locked between stator retaining plates by welding while under uniform pressure.

Core and frame form an integral unit—no loose or buzzing teeth—no change in characteristics throughout the years.

Coils formed and wound on special machinery in dust-free rooms. Vacuum impregnated with permanently plastic insulating compound.

Liberal use of copper and iron throughout results in uniformly high efficiency.

Adequate ventilation insured by skeleton frame ends and design of interpolar connections, which provide fan action.

Brush mechanism mounted on heavy, wrought iron pipe attached to stator frame end.

A patented construction feature—the F-M nutless, boltless, threadless stator—results in synchronous motors that will stand up longer, under more difficult drive conditions than motors of any other type. These radical improvements in mechanical design provide an accurate, uniform, permanently tight core in which electrical losses will not change over a period of years.

A unique method of coil winding, anti-friction bearings, vacuum impregnation of all coils, a superior type of starting winding connection—and a score of other mechanical improvements make F-M Synchronous Motors superior mechanisms subject to none of the usual causes of breakdown.

To the engineer and user of synchronous motors, these features will have an unusual appeal. We invite you to study them in detail. Simply ask for Bulletin No. 1700.

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FAIRBANKS-MORSE MOTORS

POWER, PUMPING AND WEIGHING EQUIPMENT

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speeds and feeds, lower tool expense, reduction in rejections and general improvement in production conditions. The continuous furnace, while not for the small job shop, is ideal for various industries specializing in the manufacture of automotive parts where the output is more or less standardized.

Speaking of experiments in the annealing of forgings, he said that he found it possible to anneal 0 50 per cent carbon chromium steel forgings in one and one-half hours to the correct microstructure without the development of any scale on the surface of the metal.

Several interesting observations concerning the characteristics of alloyed cast iron were made by F. W. Shipley, foundry metallurgist, Caterpillar Tractor Co., Peoria, Ill. Chromium in iron, he said, increases the hardness and strength by combining with the carbon and producing a more stable double carbide of iron which crystallizes out with the pearlite, while nickel tends to dissolve this free cementite, forming pearlite. A combination of the two alloys in the ratio of approximately three nickel to one chromium will produce an iron for automotive-type cylinders which is superior to plain iron with respect to hardness, strength and microscopic structure. The percentage increase of these properties varies in relation to the per cent of alloys used.

Excess Cementite Undesirable

Increased brinell hardness, he said, if accompanied by excessive free cementite is not desirable, but when produced by a pearlite or pearlitic-sorbite structure is an indication of increased quality. Nickel-chromium alloyed irons are much superior with respect to heat-resistant properties than ordinary irons, and irons alloyed with chromium produce a superior chill and afford a practical method for production of special castings of this type.

In discussion, V. A. Crosby, foundry metallurgist, Studebaker Corp., South Bend, Ind., in a letter, said that he believed that little argument could be offered against the use of chromium and nickel as an alloying agent, except from an economical standpoint. Concerning a point in the production of automotive cylinder iron, Mr. Crosby said that his experience indicated that a great improvement in the structure could be made by lowering the total carbon by 3.00 or 3.10 per cent.

He further believed that chromium, either alone or in combination with other elements, should not be added to motor block iron because of the ever-present double carbides of iron and chromium which may or may not be broken down into pearlite and ferrite.

Advancement in methods of heat treating ball bearing races was discussed by Haakon Styri, S. K. F. Industries Inc., Philadelphia, his observations being based largely upon results obtained in the plants of his own company.

In annealing forged rings, unfired box-type furnaces originally were used. The underfiring was found to give uneven annealing, he said. Furnaces built for overfiring were installed, with an improvement in the uniformity of product. They were objectionable, however, because the poor load distribution in the batch-type furnaces necessitated slow heating. Car-type furnaces then were installed, equipped with automatic temperature control and with oil firing direct overhead. Each furnace had a working space of 16 feet by 4½ feet by 4 feet 3 inches.

These furnaces provided much more uniformity; the actual annealing cycle was cut to one-sixth; the total saving in floor space, for the same production, was one-third; and the saving in the total cost of annealed forgings was about 15 per cent. Mr. Styri said that the fuel consumption per pound of steel was about the same.

Plan Metallurgical Advisory Board Meeting

The fifth annual open meeting of the metallurgical advisory board to the Carnegie Institute of Technology and the United States bureau of mines will be held Oct. 16, at the administration hall of the institute at Pittsburgh.

Progress made on research problems undertaken jointly by Carnegie institute and the bureau of mines will be discussed during morning and afternoon sessions by investigators from the two laboratories.

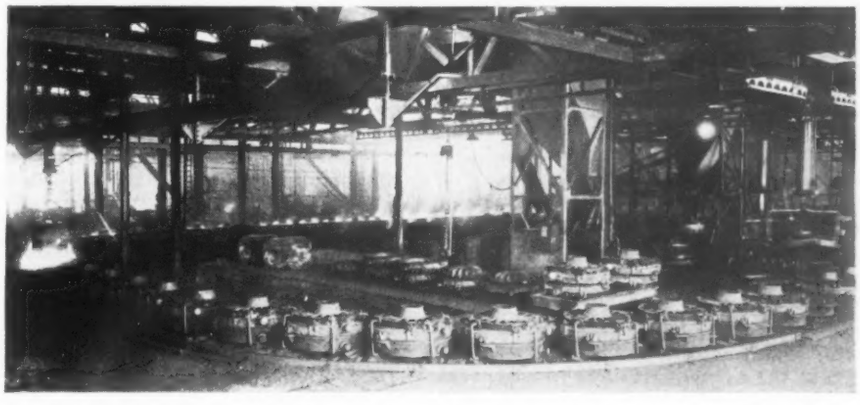
Charles F. Abbott, executive director, American Institute of Steel Construction Inc., New York, will be the principal speaker at the evening session which will follow an informal dinner at the Hotel Schenley. Mr. Abbott's subject will be "Market Research in the Steel Industry." Dr. Thomas S. Baker, president of the Carnegie Institute of Technology and organizer of the advisory board, will preside at the evening session.

The morning meeting will be devoted to reports and discussions on iron-manganese-carbon alloys and chrome-nickel alloys. Reports on research work will be given by Dr. Francis M. Walters Jr., director of the bureau of metallurgical research; Dr. V. N. Krivobok, metallurgist of the same bureau; and Maxwell Gensamer and Cyril Wells, assistants. Dr. C. H. Herty Jr., physical chemist, and M. B. Royer, assistant metallurgist, of the bureau of mines, will give a report on the solubility of carbon in iron-manganese-silicon alloys. Dr. G. R. Fitterer, associate metallurgist of the bureau of mines, will report on the electrolytic method for the determination of inclusions in steel.

Physical Chemistry of Steelmaking

The physical chemistry of steelmaking will be reported on and discussed at the afternoon session. The three outstanding contributions from this work are the development of a new manganese-silicon deoxidizer, which has been shown to be much superior to ferromanganese and ferrosilicon in combination in producing clean steel at a low cost; the development of a method of quantitatively determining nonmetallic inclusions in plain carbon steels; and the determination of the factors which affect the oxidation of steel in the open-hearth furnace. These reports will be made by Dr. Herty and other members of the bureau of mines staff.

The laboratories of the bureau of mines and of Carnegie Institute of Technology will be open for inspection the morning of Oct. 17. Members of the staffs will be present for informal discussions on various problems under investigation.



CONVEYORIZED FOUNDRY CASTS 500 CAR WHEELS PER 8-HOUR SHIFT

Casting railroad car wheels on a high production basis is a severe test on foundry equipment and calls for heavy-duty machinery. Above is a general view of pouring floor, molding stations and mold conveyors in the foundry of the Griffin Wheel Co., St. Paul, one of the largest producers of railroad car wheels in the United States. The Griffin company designed mold conveyors, molds, etc., while Link-Belt Co., Chicago, devised all sand handling and storage equipment with necessary conveying systems

Welding monel metal liner to forged flange of flexible-disk expansion joint. This liner (inset) is machined from a centrifugal casting and has holes drilled around its periphery to afford contacts in welding it to the flange

High-Temperature Expansion Joint Has Corrosion-Resisting Sleeve

AS INSURANCE against corrosion at high temperatures and pressures, the Croll-Reynolds Engineering Co., New York, is using in expansion joints up to 30-inch diameter a sleeve or liner of monel metal, a high-nickel alloy.

This liner, one of which is shown in the accompanying illustration, is centrifugally cast and machined, practically half of the metal being removed from the rough casting in machining. The noncorrosive feature of the metal prevents danger of "freezing" of the joint at slip points, some joints with this liner being designed for a 5½-inch movement under high temperatures of superheated steam and 250-pound pressures.

The liner is welded to the forged steel flange on one end, being free at the other to allow movement. The arc weld at the flange is made through drilled holes in periphery of the liner. Expansion disks of a 3½ per cent nickel steel are atomic hydrogen welded, forming a metal bellow. All seams, inside and out, are gone over twice in this welding process, a 30-inch joint requiring 230 linear feet of welding. All elements are heat treated by the Stanley P. Rockwell Co., Hartford, Conn.

Tall Stacks Should Have Lightning Protection

Factory stacks of considerable height frequently are struck by lightning bolts resulting in costly property damage and sometimes loss of life. Studying this subject some time ago, the inspection department of the American Mutual Alliance, 2200 Lake Michigan building, Chicago, reported that the average damage to chimneys equipped with lightning rods was less than one-tenth of that to chimneys not so equipped.

Stacks extending high above surrounding buildings reach up into atmosphere between the electrically charged clouds and the earth. When the accumulated cloud charges are pierced, the air insulation is broken down and a lightning stroke results. The resistance usually is least where the chimney pierces this blanket of air insulation, thus often providing a pass for the bolt in its passage to the earth. As a result, these stacks are particularly vulnerable to lightning strokes.

Lightning rods tend to prevent damage under certain conditions by facilitating the neutralization of the earth and cloud charges before they accumulate to a dangerous extent. When a heavy charge does break loose, the rods usually are able to carry it without harm to the chimney. Although rods are not absolute preventatives, they much reduce the probability of heavy damage.

According to the report, conductors should be preferably of copper and should have a carrying capacity at least equal to a No. 00 B & S gage, and when tape is used to should not be smaller than 1 x 3/32 inches. Chimneys less than 60 feet high should have at least one and preferably two rods, while higher chimneys should have at least two rods.

An efficient ground at the lower end of the rods is important. The best and generally most convenient ground is an undeground water main, but where these are not available buried copper plates are the alternative.

Management Group Changes Meeting Date

Dates for the industrial marketing conference of the American Management association have been changed to November 11, 12 and 13, at Hotel Statler, Cleveland. Included on the list of several papers to be presented are: "Product and Market Research," by F. B. Heitkamp, sales manager, Cincinnati Milling Machine Co., Cincinnati; "The Use of Engineering Service in Selling," by R. S. Perry, vice president, Ingersoll Milling Machine Co., Rockford, Ill.; and "Using Salesmen in Industrial Market Analysis," by D. M. Strickland, manager, development department, American Rolling Mill Co., Middletown, O.

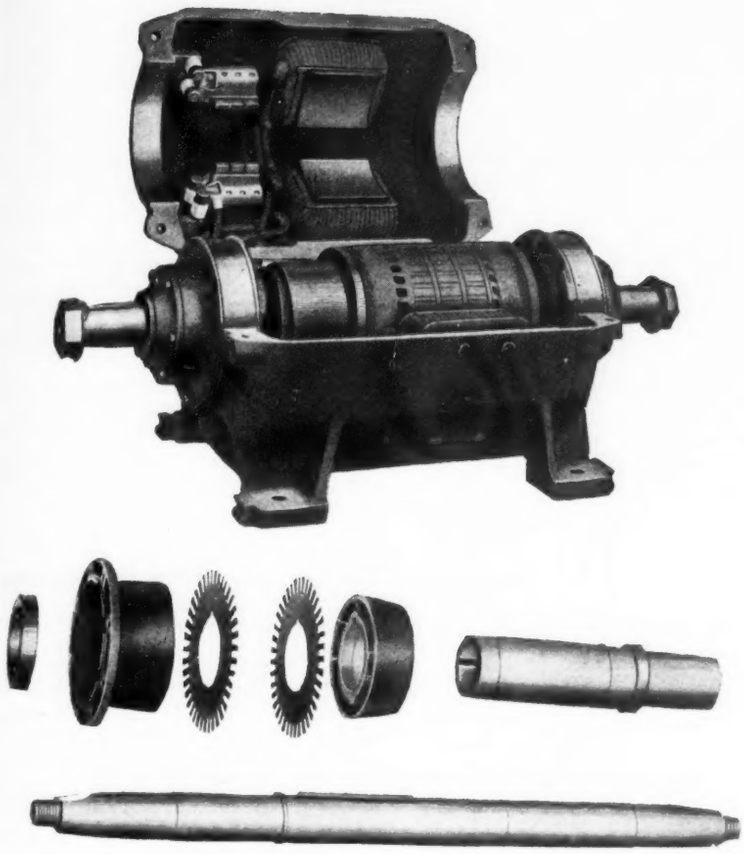
The 1931 annual business meeting of the management association will be held the first day of the conference. Election of directors, amendments to by-laws and other business will be considered.

New School Teaches Design Of Welded Buildings

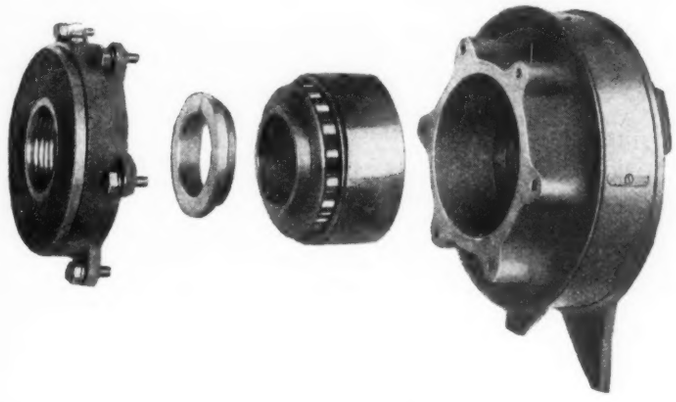
General Electric Co., Schenectady, N. Y., has announced the opening at Schenectady of a school of welding design to teach engineers, architects, draftsmen, etc., both in and out of the company's employ, methods of designing welded buildings. There is no charge for instruction in the course, which requires approximately four weeks for completion. It is a flexible one and can be adjusted to suit the individual.

The course requires that the applicant be an engineer, or have some training in structural design or some experience in the design of riveted structures. It is then only necessary for him to learn the difference between the application of welding and riveting to steel frames. The subject is approached from a scientific point of view based on studies and tests by the General Electric Co. over a period of years in welding work, particularly in the construction of its own factory buildings.

Here's Further Proof of Superiority



Disassembled view of Type MD motor armature core showing shaft, shrink ring, rear head, punchings, front head, and spider



Type MD frame head disassembled showing bearing cap, thrust plate, and roller bearing

TYPE MD—the steel–mill engineer's motor—has a shaft of high-grade steel—accurately machined. An armature spider, machined from heavy seamless steel tubing, is pressed on this shaft and keyed. The entire armature with commutator is assembled on this spider, and thus the shaft can readily be pressed out without any disturbance or injury to vital motor parts.

The armature core of the Type MD motor is formed from steel laminations keyed to the steel spider and rigidly clamped between two malleable-iron heads. The front head rests against a shoulder formed on the spider. The rear head is locked in place by a steel ring, which is shrunk into a recess in the spider while the core is clamped under pressure in a hydraulic press. Thus the core cannot loosen under any circumstances.

Roller bearings are used in all MD motors, and are completely enclosed in a frame head which is *removable with the armature*. Hence, the bearings are protected from dirt if the motor is disassembled on the job. The construction prevents lubricant getting on the motor commutator or windings.

The Type MD is designed to meet the standardized dimension and rating specifications of the A. I. & S. E. E.

233-11

GENERAL ELECTRIC

Large Uses of Steel In Small Ways

201st Article — Airway Beacon Towers

APPROXIMATELY 10,000 tons of steel is in service in the 1650 airway beacon towers, beacon mechanisms and operating sheds erected so far for the airways division, department of commerce. During the last fiscal year the department purchased 233 units, and while the requirements for the present fiscal year have not been decided it appears they will be no less than in the preceding year. The average amount of steel in these units, including the tower, beacon, mechanism and sheds, is about 6 tons.

Congress has provided for 2000 additional miles of lighted airways this fiscal year, which if built will require a beacon tower every ten or 15 miles. This is a rapidly expanding field for the use of steel. Practically all airway beacons are operated by the airways division, aside from those installed at privately operated aviation fields.

Light Weight Material Used

Light structural sections, sheets and bars comprise most of the material used. Bolts and nuts, lead washers, wire, cable, conduits, pipe, mesh, subway-type gratings, switches and steel cabinets also figure in the requirements. Structural material is open-hearth steel, and all steel parts are hot-dipped galvanized.

The standard galvanized steel skeleton tower is 51 feet high, weighing approximately 2000 pounds, exclusive of platforms, footing plates, bolts, wind cone brackets and other auxiliary parts. Weight in higher towers and extensions mounts rapidly. A 91-foot tower weighs 4200 pounds, while a 24-foot extension adds 1800 pounds; and a 40-foot extension, 2800 pounds. Some towers rise 152 feet, additional heights being obtained by use of extensions below the basic 51-foot section with heavier footing posts and anchors. The highest towers weigh 8500 pounds exclusive of parts.

The 51-foot standard tower is fabricated to permit attachment of extensions up to 101 feet which brings the completed tower with such extension to 152 feet. All towers and extensions are fabricated to allow them to be interchangeable. To facilitate transportation and erection, no piece may be more than 22 feet long.

A platform, 7 feet square, with subway-type steel grating floor, and angle-steel guard rail, is provided as a working deck for mounting and servicing the beacon and other apparatus in the top of the tower. Several types require the installation of an auxiliary platform, weighing 250 pounds, 7½ feet above the main platform.

Standard galvanized steel airway beacon tower with revolving light, and wind cone

Towers at intermediate landing fields are equipped with wind cone brackets weighing approximately 200 pounds each. Oversized footing plates for extensions weigh from 25 pounds to 60 pounds, while a complete set of bolts for a 51-foot tower weighs 90 pounds, taller beacons taking more and heavier bolts. A 91-foot tower, for instance, requires 210 pounds of bolts.

Ladder side rails are 1½ x 1½ x ⅛-inch angles, 15 inches apart, being fastened in the concrete foundations as well as to the girts. Rungs are of hollow pressed steel spaced 15 inches apart. Rung ends are flattened, crimped and riveted with two ⅜-inch rivets at each end. The top of each ladder section is formed to telescope into the bottom of the section above and all towers are fabricated to enable the ladder to be attached to any one of the four faces of the tower.

Various types of beacons are used, one being operated by commercial power. This unit has a 24-inch revolving electric beacon with two 18-inch course lights mounted on the tower. A weatherproof steel cabinet mounted at the foot of the tower and another on the tower platform house switches, wires, control equipment and fuses.

Beacon units operated by engine generator sets have a small ground shed of sheet steel, housing the engine, and also a 515-gallon steel tank. Sides and roof of the sheds are No. 26 gage galvanized, crimp steel sheets, with galvanized rolled ridge cap. No. 28 gage galvanized steel sheets are used for flashings and trim at gables and eaves. The entire building is lined with No. 28 gage galvanized beaded steel sheet.

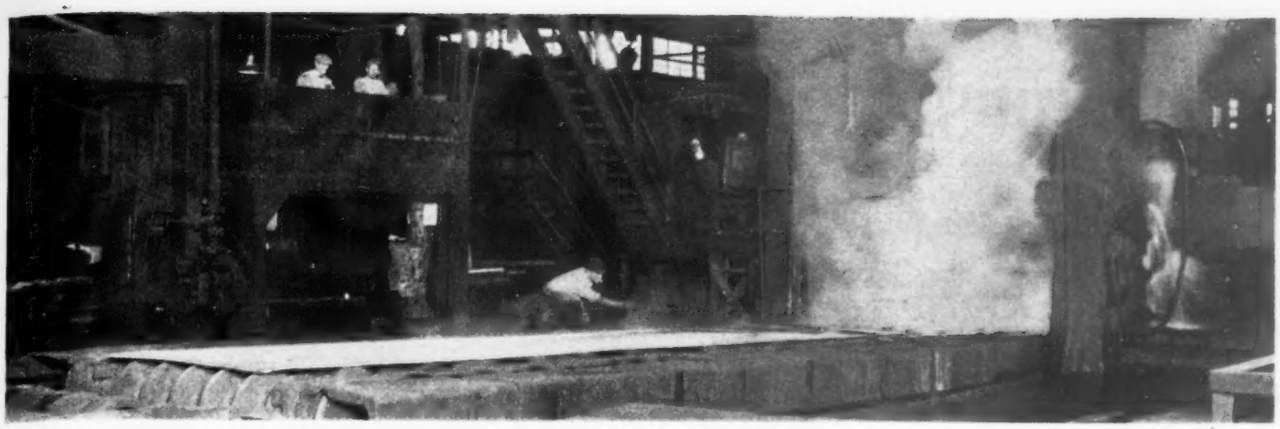
Acetylene blinker-light units have a steel tank house, with pipe, manifold, valves and gages connecting and controlling the flow from the tank to the lantern.

Technical School Announces Industrial Conferences

Three industrial conferences, sponsored by Case School of Applied Science and the Cleveland Engineering society, have been arranged for the academic year 1931-1932, to be held at Case School of Applied Science, Cleveland. These conferences, started last year with gratifying success, have as their aim acquainting those active in engineering and manufacturing development with the latest progress in some particular field in the hope that application of such knowledge will be stimulated.

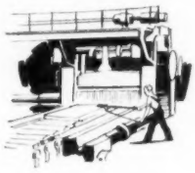
The conferences this year will be three in number, the first being on metals and alloys, in November; the second on air conditioning, in January; and the third on industrial fuels, in March. The conference on metals and alloys, scheduled for Nov. 18-20, will be arranged to appeal to engineers interested in the use of alloys in building and decoration; alloys requiring resistance to corrosion, high temperature, wear and fatigue; and alloys used in the manufacture of machines, aircraft and other products.

Fully qualified speakers will be selected with no limitation upon affiliation or location. Demonstrations and exhibits of specimens and equipment will be conducted in the college laboratories, there being no charge to the exhibitor for space. Further information on the conferences may be obtained from Fred L. Plummer, consulting engineer, 10900 Euclid avenue, Cleveland.



PROGRESS IN STEELMAKING

TEMPERED steel bands tensioned around bundles of hot rolled strip steel for bracing the material in box cars are being used by a stripmaker in dispatching shipments. This obviates the use of spikes and heavy bracing timber and affords the consumer the convenience of handling the stock in bundles.



TO ELIMINATE the human element and obtain unvarying precision and uniformity in rolling, a mill in the Chicago district employs six screwdown controls which function automatically. With this device, a predetermined amount of reduction of the distance between the rolls is provided by plugging in leads at certain points and, when the mill is in operation, the adjustment is provided automatically and at correct intervals.

One man by the use of this apparatus operates the entire mill. When an ingot is served to the rolls, the operator throws a pass master switch, which starts the screws turning for the proper adjustment for the first pass. After the ingot has passed through the mill, the operator moves the pass master switch to the second position and so on. By throwing the switch to the off position the operator may resort to manual control at any time. Each device contains more than 230 contacts through which the operation is controlled.

♦ ♦ ♦

A gas leak in the downcomer pipe of an Ohio blast furnace recently was stopped by the application of a cheap mixture, saving many hours of lost time which otherwise would have been necessary in making permanent repairs. The mixture consisted of one part of fine iron drillings and one-half part salt to one part of water glass and was applied to the leaky joint while the blast was off the furnace.

♦ ♦ ♦

One trouble with 18 and 8 chrome-nickel alloy in service in the oil industry is that when overworked it has been prone to fail without warning. A new discovery involves the use of a slight quantity of an additional alloying element. When produced with this additional element, the 18 and 8 alloy develops a great ductility, so that when about to fail in service, it gives warning by bulging or warping in the same way that plain carbon steel gives warning.

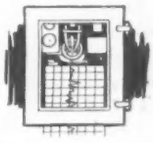
♦ ♦ ♦

Reducing the amount of cooling water to a minimum, has afforded a savings of 50 per cent in bearings, a saving in friction loss and an improved roll neck surface at a merchant mill in the Chicago district.

FREQUENTLY when cutting rusty or dirty steels with an oxyacetylene blowpipe particles of scale or dirt become attached to the nozzle and tend to block the passage of the gases. This difficulty has been overcome in the shop of one company by holding the blowpipe at a slightly greater distance from the surface and pointing the flame slightly forward.

♦ ♦ ♦

An efficient method of removing excess zinc from the surface of galvanized pipe is followed by a western plant. The pipe leaving the bath of zinc is moved on magnetic rolls through a ring of jets which direct compressed air around its periphery. This strips off any excess coating on the exterior. When the piece has passed through the ring it contacts with a nozzle which automatically releases a blast of compressed air on the interior, thus freeing this surface of any excess quantity of coating.



OPEN-HEARTH furnaces now operating with automatic temperature difference reversal control are showing fuel savings ranging from about 7 to 20 per cent. Education of the first helper to this new type of control has been found to improve results considerably; one first helper used more fuel than necessary and when replaced with a first helper who had had experience with the control, the fuel consumption was reduced materially. One 250-ton furnace equipped with this control ran two hours on one side while a hot repair was being made to the brickwork. The automatic reversal control gradually brought the furnace back to a balanced condition, in 8 reversals, over a period of about two hours, and the balanced condition was regained automatically without any attention on the part of the first helper. Use of the control has increased campaigns at one plant about 30 per cent due to increasing life of the refractories.

♦ ♦ ♦

Rubber lining is one of the latest means of preventing the exposure of metal pickling tanks to acid. Before the vulcanized rubber is applied the inside surface of the tank is sandblasted and then given a coat of special binder which interlocks the rubber with the pores of the metal.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

Cold Drawn Shapes

Economy in designing by the use of cold drawn and extruded sections, discussed by H. B. Veith, in Machine Design, September 1931, *p.* 48, 4 *pp.*, 7 *illusts.*

A shape of desired size is not necessarily produced with one pass through the die. It may require a number of drawing operations to turn out the finished product. Considerable mechanical hardness is imparted to the material by drawing and, therefore, it must be annealed between subsequent drafts. Tolerances usually specified are in accordance with the size of the shapes; under many conditions where the distribution of metal permits, these shapes are accurate within plus or minus 0.001-inch. Hardness increases with cold working, the latter often producing a gain of 15 to 20 per cent. The drawing process by compressing and consolidating the texture of the metal gives a refined structural surface which is valuable. As in the case of cold drawn shapes, extruded shapes have a high-tensile strength. As the extruded metal is dense and thoroughly worked there is little liability of pin holes in the surface of the piece. Extruded metal is machined readily, and because of the smooth surfaces, finishing costs are reduced to a minimum. The exact uniformity of extruded sections permits parts to be handled quickly and accurately in jigs and fixtures.

STEEL, 10-1-31

High-Speed Steel

Materials, heat treatments and rake angles for super high-speed steel, discussed by J. M. Highducheck, in American Machinist, Sept. 17, *p.* 450, 4½ *pp.*, 5 *illusts.*

It is important to consider the shape and design of a tipped tool, especially when using high-cobalt steel for tips. Avoid, if possible, the forging of the tips to the desired shape for the tool shank. Design the required tipped tool so that virgin stock can be used; or use the steel from bar stock by cutting or sawing to the desired length. In forging high-cobalt steel it is important to heat slowly to a scaling heat ranging from 1800 to 2100 degrees Fahr. and forge uniformly. Extreme care at this point must be exercised because forging at too low a heat tends to cause cracks. The hardening process of high-cobalt steel requires a slow preheat before the hardening treatment. Because of the high heat required in treating this grade steel, the decarbonized surface must be ground off thoroughly. A chart, which accompanies the article, shows a complete list of forged tool shapes that are considered standard for present-day production. Each type of forged tool shapes is named in line with the appropriate application. Shank sizes and respective lengths permissible in production are listed.

STEEL, 10-1-31

Melting in Hydrogen

Details of melting nickel-chromium alloys in hydrogen, discussed by C. J. Smithells, S. V. Williams and E. J. Grimwood, at the annual meeting of the Institute of Metals, Zurich, Switzerland, Sept. 13-15.

The authors showed that sound ingots can be produced by this method provided all the oxides present in the melt are reduced by hydrogen before casting. If any oxides remain in the melt, these are reduced by hydrogen, which is liberated at the moment of solidification, with the formation of steam, which causes blowholes. For casting in air it is necessary to displace the hydrogen with nitrogen before pouring. The effect of using various grades of raw material in the preparation of the alloys was presented. Alloys prepared from commercial materials have been found to give better resistance to oxidation than those prepared from pure materials. The probability that the presence of certain impurities has a beneficial effect was confirmed by making deliberate additions of elements known to be present as impurities in the raw materials. The process of hydrogen melting of nickel-chromium alloys is being applied on a commercial scale.

STEEL, 10-1-31

Belt Elevator Design

Details in the design and operation of belt elevators, discussed in Materials Handling News, August 1931, 3 *pp.*, 1 *illust.*

Permissible speeds range from slightly over the ideal down to 84 per cent of the ideal speed for each head wheel size. When operated at 84 per cent of the ideal speed, the material leaves the bucket at 45 degrees past top center and this is as low as can be used with efficiency. Centrifugal force also influences the action in boot, and tends to prevent the filling of the buckets, unless the foot shaft is placed lower than the loading chute. By following the latter method a foot pulley diameter equal to 2/3 of the head pulley diameter can be used. Capacity is inversely proportional to the spacing of buckets up to the point where the spacing is so close that the buckets interfere with the discharge.. With buckets for general use, the spacing from center to center should be about 2½ times the projection from the belt. Too small pulley diameters are likely to reduce the service from an elevator belt. Continuous bucket elevators do not present the same problem because the size of the pulleys may be increased without necessarily increasing their rim speed. Various formulas and tables are included in the text.

STEEL, 10-1-31

New Welding Process

Recently devised process of welding which affords increased speed, discussed in Oxy-Acetylene Tips September 1931, *p.* 147, 5 *pp.*, 8 *illusts.*

High-strength welds made at high speed by the new method are achieved by a special flame adjustment which permits an excess of acetylene, the use of a special welding rod and a new welding technique. The latter is what is known as backhand welding, in which the flame is pointed backwards against the weld, and the flame and rod manipulated more or less parallel to the line of welding. The flame is played alternately upon the base metal to prepare it for fusion and on the rod for accelerated deposition of weld metal. Little breakdown or melting of the base metal is required with the correct procedure, and as a much smaller spacing can be used, due to the decrease in the contraction of the weld, a decided economy is effected in the amount of rod, welding gases and the time required for welding. In pipe line welding, the welding is done at the top of the pipe while the pipe is being rotated away from the welder. Many field tests of the new method are discussed in detail.

STEEL, 10-1-31

MORGAN ENGINEERING MEANS MILL EFFICIENCY

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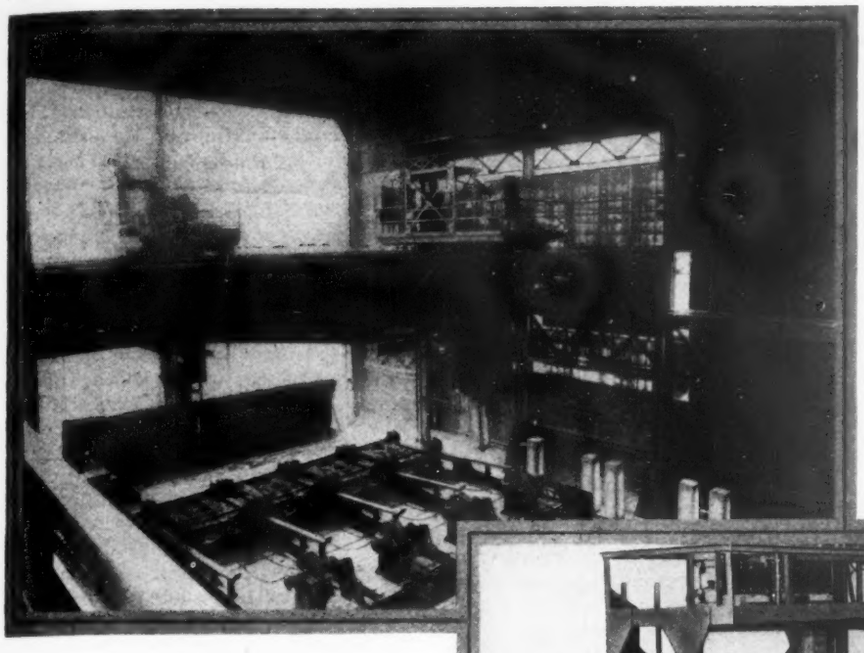
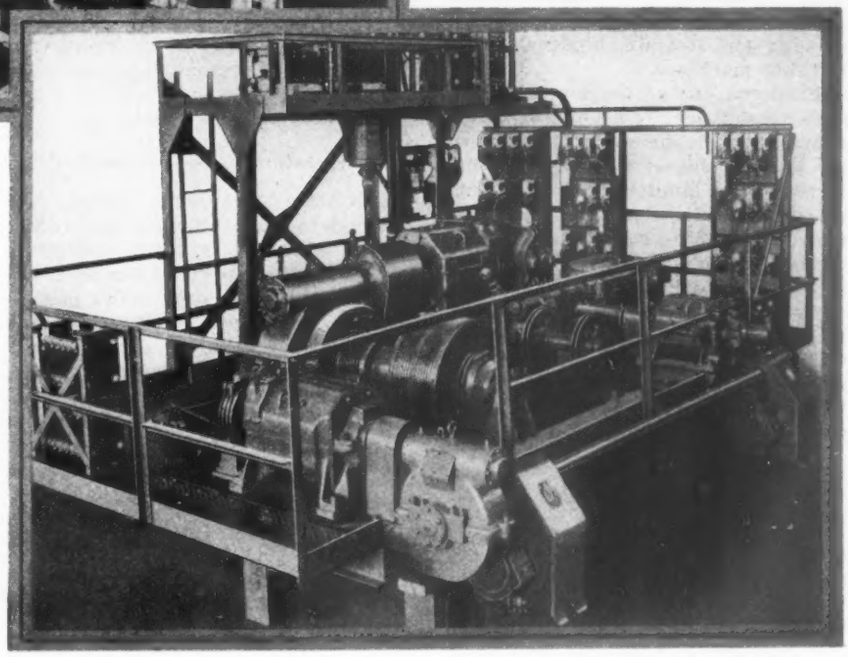


TWO MORGAN 7½-TON 6-MOTOR, 63′-6″ SPAN 4-GIRDER, LOW TYPE SOAKING PIT CRANES

Provided with auxiliary girders on each side of bridge for supporting bridge motors, etc.



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Worm operated for high efficiency and symplicity. Equipped with roller bearings for power saving and low maintenance . . . One-piece box section steel casting trolley frame is provided for extreme rigidity.

These cranes have replaced two Morgan Tower Type Pit Cranes which were in service for 30 years.

For Pit Crane information write for Bulletin No. 32

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Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

Labor-Saving Machinery Brings About "Technological Readjustment"

TECHNOLOGICAL unemployment, under various other names, has persisted as a fearful expectation since the earliest applications of labor saving machinery. Inspired by this fear, workers attempted to forestall the extinction of what they believed to be their only means of livehood, by rising up en masse and destroying early saw mills, textile machinery and certain pioneer metal working machines.

Hindered only momentarily by such resistance, development and adoption of labor-saving machinery has moved inexorably onward for more than a hundred years and has penetrated industries in which it was undreamed of by early advocates of mechanization. In view of dire effects foreseen by early economists as well as by workmen, which fears frequently have been revived during periods of industrial depression, the fact that in normal times there have been an increasing number of better jobs for an increasing number of people, is rather surprising.

Hardships of Handicraft Era

Without going into the subject to any great depth, it appears from a study of industrial history that in the "handicraft era," the average worker either was engaged in providing luxuries for a favored few, or in working out his meager livelihood directly from the soil by unrelenting labor or indirectly by equally unrelenting labor at a forge, hand loom or by other primitive means. In no case did he have those things which we today consider to be common necessities of life, nor was it possible for the average worker to accumulate anything of a surplus. It is not strange that to his mind the advent of the labor-saving machine spelled disaster.

What was not foreseen was that more things would become available to more people through machinery, that a rising tide of demand for these machine-made things (textiles, shoes, prepared food products, tools, hardware, vehicles, etc.) would follow, with the result that in spite of labor-saving machinery, industrial employment would grow by leaps and bounds. Nor was it foreseen that working conditions would improve immeasurably, and that the better things in life would become available to the workers themselves. Furthermore, other great and unforeseen markets for manufactured goods have opened up whenever "saturation" has appeared to be imminent.

Evolution of Mechanization

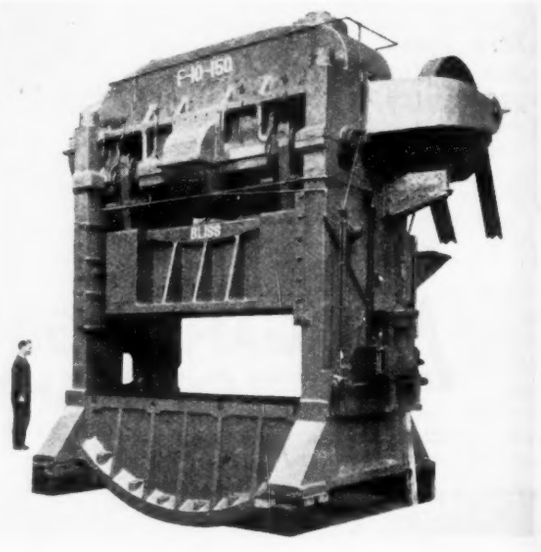
All this has come about, not through sudden changes but rather it has been a gradual evolution. While its average trend has been upward, there have been many periods when mechanical developments seemed to come too rapidly for proper digestion into the industrial system, or when political and economic upsets threw the industrial system out of gear for a time. During such periods there has been acute hardship among workers, resulting in bitter condemnation of the existing industrial system, but with certain readjustments, upward progress always has been resumed.

Whenever a new type of labor-saving machine, no matter how simple, has been adopted, it has demanded that certain workers either learn to do an old thing in a new way or has demanded that they learn to do something which they never before have done. Those who have refused to learn, have not had the capacity to learn or have been too old to learn, have fallen by the wayside, but they have been only a comparatively small percentage of all those affected. This fortunate capacity for readjustment possessed by the majority of industrial workers has made possible the so-called machine age. In other words it appears that technological unemployment eventually is relieved most effectively by a process which might aptly be termed "technological readjustment."

◆

Equalized Slide Pressure Featured in Large Press

E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y., recently has designed and built a large

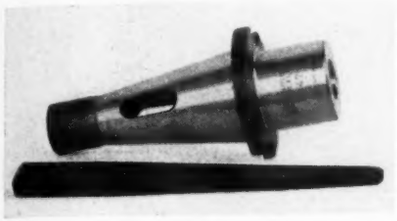


THIS unusually large press, built by E. W. Bliss Co., has two double crank shafts which insure balanced pressure at the four corners of the slide. Tipping thereby is avoided when dies are unsymmetrical

press in which are incorporated a number of unique features. This machine is shown in the illustration which appears on Page 56.

This press has two double crank shafts geared together to revolve in step in opposite directions, thereby distributing pressure equally to the four corners of the slide. Regardless of unsymmetrical shape of the dies, the gibs do not have to restrain tipping of the slide.

The crown has a cored box section with a vertical web over each crankshaft, these webs constituting beams which are stiffened to an unusual degree by connecting flanges and diaphragms. Tie rods pass outside the shafts through broad uprights which give stability to the frame. As openings for heating the tie rods are in the bed instead of being cored in the uprights, maximum frame stiffness is assured.



Brown & Sharpe adapter for use in new milling machine spindles

The pitmen, or connections from cranks to slide, are nonadjustable. Slide adjustment is effected through four screws attached to wrist blocks sliding in bored holes. Nuts on these screws are rotated through gear trains from an adjusting motor on the slide. A special locking mechanism seats pressure surfaces of the screws and nuts firmly together. Means also are provided for leveling the slide face by adjusting the screws independently.

The main gear train, located in the middle of the press, consists of three gears, a pair of equal gears meshing together and connecting the two crank shafts and a rear gear engaged by a driving pinion. The intermediate shaft extends to the left, where it connects with the drive shaft through herringbone gearing of suitable ratio. This train, as well as all of the main gears, are housed oil tight.

Of the three drive shaft brackets, two are integral with the crown, while the third is outboard, bracketed to the crown. The drive shaft carries a flywheel clutch, balanced brake and hand brake for idle flywheel. It is mounted on taper roller bearings.

A circulating system of oil lubrication is built into this press. A motor driven pump draws oil from a supply tank and forces it through a filter into a supplying main. From this main, sight feed lubricators lead to every bearing. Larger quantities of oil are fed to the two gear trains. A recovery system drains the oil back to the supply tank. The pump can be started before the press, to flood the bearings with fresh oil.

The press has a 70 x 150-inch bed. Distance from bed to slide, with stroke down and adjustment up, is 36 inches. The stroke is 10 inches and slide has 6 inches of adjustment. Distance between uprights is 150 inches. The floor space occupied is 142 x 250 inches and net weight of the machine is about 250,000 pounds.

◆

Adapters Are Designed for Use on Milling Machines

Brown & Sharpe Mfg Co., Providence, R. I., has put on the market new cutter adapters for use with milling machines having modern standardized spindle noses, with No. 40 taper. One of these adapters, together with the drift used for ejecting tools, appears in the accompanying illustration.

By means of these adapters, end mills, collets and other tools and accessories having No. 3 Morse and Nos. 7 and 9 Brown & Sharpe taper shanks can be used in the new standard spindle.

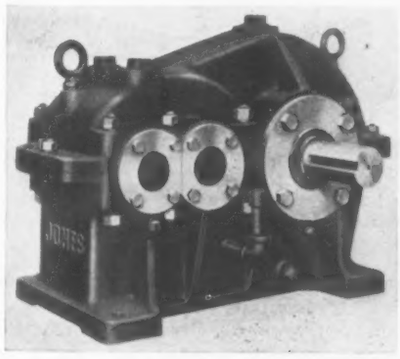
The maker points out that inasmuch as there are as yet comparatively few milling machines out equipped with spindles having No. 40 taper seats, these adapters anticipate plans of several manufacturers to incorporate this taper into the designs of their small machines.

◆

New Speed Reducers Built For Small Motor Drives

W. A. Jones Foundry & Machine Co., 4401 Roosevelt road, Chicago, announce a new line of double reduction speed reducers of herringbone-Maag type, these being designed for use in connection with small motor drives. One of these units is shown in the accompanying illustration.

In design, construction and quality of manufacture, these units are in every way equal to the larger units built by this company. Double helical gears, accurately generated right and left hand, and being in effect a herringbone gear with a wide gap, are used for the initial, or high speed, reduction. The low speed reduction



Small speed reduction unit built by W. A. Jones Foundry & Machine Co.

consists of an accurately generated Maag pinion and gear. Tapered roller bearings are used throughout.

Units having a wide range of ratios are carried in stock, assuring prompt delivery to meet any ordinarily requirements.

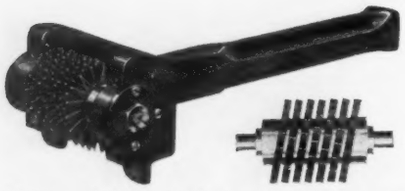
◆

Riveter for Blower Rotors Suggests Similar Uses

Hanna Engineering Works, 1765 Elston avenue, Chicago, has developed a special riveting machine for use in fabricating sheet steel blower rotors. This machine, which is shown with work in progress in the accompanying illustration, is suggestive of many other special applications to which machines of this type can be put.

This riveter is equipped with four stakes which are quickly interchangeable. Accuracy and rigidity of

Hanna riveter for fabricating sheet steel blower rotors



Heavy duty grinding wheel dresser made by Desmond-Stephens Mfg. Co.

their mounting is attained by the use of two bolt-drawn wedges, supplemented by two bolts which grip the stake between the two side walls of its slot in the main frame.

In this particular rotor the back plate is flat and the rim plate conical. The riveter "buck up" die stake, which enters between the plates and the blades, must be of one shape for rivets in the flat back plate and of another shape for those in the conical rim plate. As rotors may be for either right or left hand rotation, the blades may curve either clockwise or counterclockwise, consequently requiring two pairs of stakes.

The rivets, which serve to attach the curved blades to the circular side plates in this case, are driven cold. The driving mechanism is designed for this kind of service, ordinary variations in rivet length and plate thickness being compensated for automatically on account of the uniform pressure range of the die stroke.

◆

Dressing Tool Is Designed For Large, Coarse Wheels

Desmond-Stephen Mfg. Co., Urbana, O., recently has put on the market the wheel dressing tool which is illustrated at the top of this column.

This is a heavy duty tool especially designed for dressing the large, coarse wheels bonded with synthetic resin and operated at high speeds. It is pointed out that the dresser will also work equally well on vitrified and silicate bonded wheels.

The tool is 14 inches long and 5½ inches wide at the head. The cutters are tool steel, 14 in number, and are 2⅜ inches in diameter. They are staggered at an angle to cover a 2¾ inch face when revolving. The angular arrangement of the cutters, it is stated, gives a shearing effect in addition to the usual rotary action of the cutters and it is pointed out that this shearing effect is advantageous in dressing properly the high speed wheels as used in rough grinding operations.

Dust proof ball bearings support the ends of the cutter spindle which permit the cutters to rotate without binding. The cutters may be changed easily by moving four large screws and a simple adjustment takes care of any end play that may develop.

◆

Pistons Are Relieved by Centerless Grinding

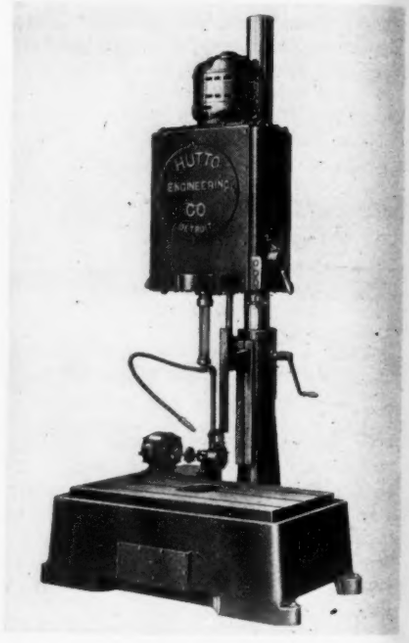
Cincinnati Grinders Inc., Cincinnati, has brought out a modified type of centerless grinder by means of which automobile pistons can be relieved accurately and at low cost. In the accompanying illustration the mechanism of this machine, with work in process, is shown in considerable detail.

A special work holding and driving unit replaces the standard regulating wheel housing and upper and lower slides on a No. 2 centerless grinder built by this company. This special unit is driven from the standard feed box.

The piston is carried on a mandrel and is rotated by a floating driver. Downward movement of an operating lever engages a clutch which sets the work to revolving. The piston is supported by three sets of rollers and as the operating lever is brought down, the upper roll at the right brings the work forward to its pivoting support and exerts proper pressure on the work to insure proper grinding.

A cam, which gives oscillating movement to the work for grinding the relief portions, also is actuated by the downward movement of the lever. Work rotation is so timed with this cam that correct relief is assured. After the reliefs are ground, the operating lever is raised, thereby terminating the oscillating movement and disengaging the clutch which drives the work.

With 0.003 inch of stock to be removed, five pistons per minute can be relieved by this grinder. The maker points out that this equipment also is useful in the grinding of a large variety of cam shaped work.



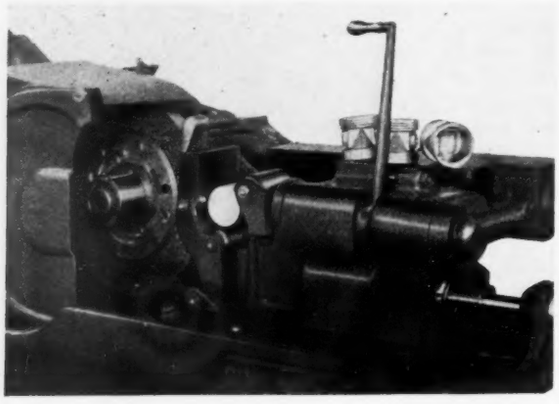
Hutto grinder for large bores operates on honing principle

◆

Large Bores Are Finished By the Honing Process

Hutto Engineering Co. Inc., 515 Lycaste avenue, Detroit, has developed a new machine for the finish grinding of large, heavy work by the honing method. One of these machines is shown in the accompanying illustration.

While this machine, which is of vertical type, will operate on bores ranging from 1½ to 8 inches in diameter, and up to 15½ inches in length with standard hones or up to 18



Attachment developed by Cincinnati Grinders Inc. for rapidly and accurately relieving automobile pistons. It replaces regulating wheel and slides on standard centerless grinder

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CAN SECURE

LOWEST ULTIMATE COST

BY ADOPTING THE

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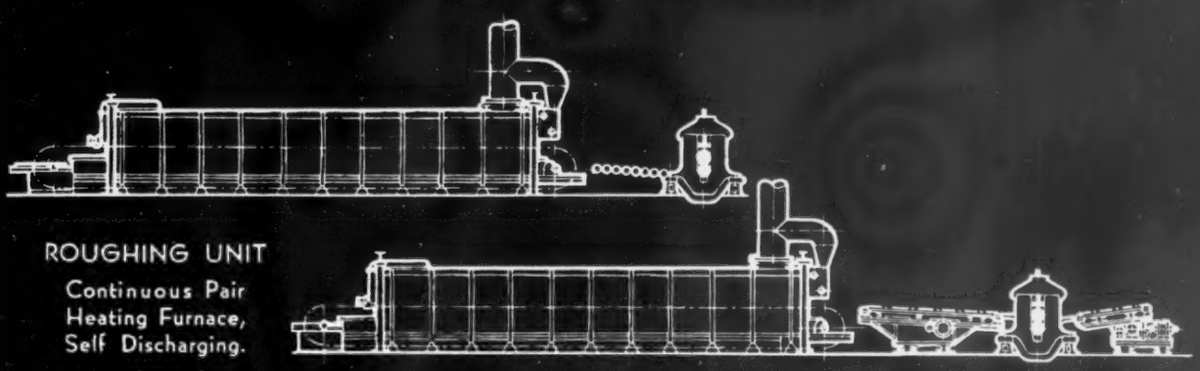
Trade Mark



ROUGHING UNIT

Continuous Pair Heating Furnace, Self Discharging.

FINISHING UNIT

Continuous Pack Heating Furnace, Self Discharging, Mechanical Feeder and Catcher.

The Continuous Heating Furnaces and Mechanical Equipment for 2 High Mills included in this System are covered by one or more of the following patents: Nos. 1,702,739, 1,730,739, 1,746,488, 1,750,534, 1,760,762, 1,767,574 and 1,779,964.

License to operate under *all* of these patents and other patents pending can be furnished only by The Wean Engineering Company, Inc.

THE WEAN ENGINEERING COMPANY, INC.

WARREN, OHIO

Flinn & Dreffein Co. — *Associated Companies* — The McKay Machine Co.

inches in length with special hones, floor space of only 40 x 54 inches is required.

The heavy cast iron base embodies a coolant reservoir of 45-gallons capacity. A motor driven pumping unit in conjunction with an efficient filter assures a copious flow of clean coolant to the working points.

The head, which is carried on a substantial steel column, can easily be raised and lowered by means of a convenient crank on the sleeve in which the column slides. The spindle is mounted in phosphor bronze bushings and telescopes to allow withdrawal of hones without disturbing the setup. The spindle is operated by a vertical motor which has a remote control automatic starter.

Four reciprocating speeds and two rotating speeds are provided, making it possible to attain any required degree of finish. The machine is rugged and at the same time of precision construction. A liberal number of high grade ball bearings are used and gears are of helical type.

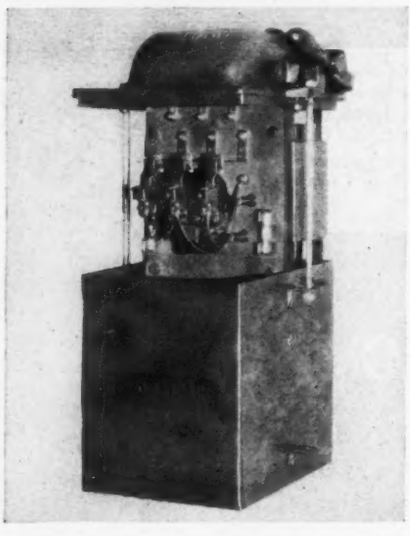
The maker recommends this machine for the finish grinding of such bores as those of large truck, airplane, marine and diesel motor cylinders.

◆

Control for Small Motors Built for Rough Service

Rowan Controller Co., Baltimore, Md., recently has introduced a combination safety switch and magnetic contactor for use with small alternating current motors. One of these devices is shown in the accompanying illustration.

The unit is of compact design and being completely oil-immersed, it is vapor-proof, weather-proof and dust-tight. These characteristics, plus its rugged construction, make it particularly suitable for use under rough service conditions such as are met with in steel mills.



Safety switch and magnetic contactor built by Rowan Controller Co.

◆

Stream-Line Presses Are Hydraulically Operated

Oilgear Co., 647-683 Park street, Milwaukee, announces the addition to its line of standard machines of five capacities of hydraulically operated presses. These new machines, of which one of 6-ton capacity is shown in the accompanying illustration, are of "stream line" design, the frame structure containing the entire operating mechanism.

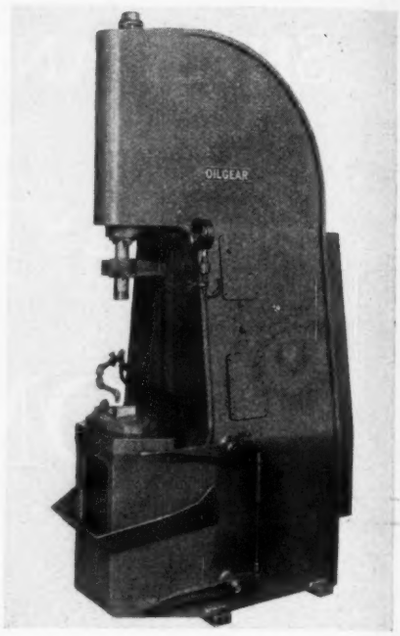
These new presses are recommended especially for assembling, broaching, and forcing, as well as for general manufacturing operations. They can be furnished with variable delivery, constant pressure or constant displacement pumps manufactured by this company. As in the case of the pumps, a choice of control mechanisms further enables the presses to be equipped to meet specific working requirements.

Main frames are one-piece steel structures fabricated from heavy plate by welding. Welded steel guards cover the open sections at the rear of the frames. Press cylinder tubes are honed, pistons and rings are carefully fitted, and the ground and polished rams, which pass through leakproof molded packings, are guided rigidly in the front heads. Direct reading gages indicate working pressures.

Control Features

In all models, both hand and foot controls are furnished, which are supplemented by semiautomatic or full automatic controls. Any ram speed within the limits of the machine can be attained by motion of the hand lever or foot pedal when the machine is equipped with a variable delivery pump and semiautomatic control. The ram can be started and stopped instantly and can be regulated by setting stroke-limiting dogs. Full automatic control allows continuous ram motion through any desired stroke.

When the press is equipped with a constant pressure pump, the ram can be stalled and maximum pressure held continuously without overheating or loss of power. In this case, ram speed can be varied by means of a convenient external adjusting screw. If a constant displacement pump be used, ram speed is constant, with top and bottom limits adjustable.



Oilgear self-contained hydraulic press of streamline design

These presses are built in 2½, 3½, 6, 10 and 15-ton capacities, all having the following general specifications: Stroke, 18 inches; daylight space, 24 inches; depth of throat, 8 inches; size of platen, 10 x 13 inches; hole in platen, 4 inches in diameter; height of platen above floor, 20½ inches; total height, 102 inches; floor space occupied, 35½ x 43 inches; and weight 4100 pounds.

◆

Contactor Type of Control Developed for Trucks

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has built for Mercury Mfg. Co. a new type of control equipment for use on storage battery trucks. A unique feature of this equipment is its ability to handle motor reversal entirely through contactors. This eliminates the usual large drum-type reverser.

The equipment consists of a master switch, and a panel on which are mounted individual contactors for making and breaking the circuit from batteries to motor. The master switch serves to operate the control circuit to the contactors.

The maker states that contactor controls of this type can be supplied for use on battery driven trucks ranging in size from small industrial types to large vehicles for street use.

Sentiment Improves with Wage Cut

Basis Believed Laid for Business Recovery — No Effect Yet Apparent in Prices—Seasonal Influences Lacking, Operations Down to 29 Per Cent

WITH September output of pig iron and steel ingots proving to be the lowest so far in the depression, it is apparent seasonal influences are entirely impotent, and that any hope for improvement over the remainder of the year must be predicated upon a stimulus flowing from the 10 per cent cut in common labor wage rates, Oct. 1. This reduction by the Steel corporation has been adopted by practically all producers, and while the effect of it is not yet in evidence it is confidently believed to be laying the groundwork on which recovery will be based.

In defense of the wage revision, it has been said that such a step was necessary not only to mitigate operating losses but also to stimulate business and thus recompense labor by providing a larger volume of work. Though the resulting decrease in cost of production is regarded by some as compensation for losses already incurred, the opinion is growing that the full benefits will not be realized until consumers are persuaded prices have been entirely liquidated.

On virtually all steel products, third quarter prices have been extended into fourth quarter, and while these prices are patently unremunerative they are stable and not under pressure. The course of prices, therefore, will be minutely scrutinized by important buyers. The belief on the part of consumers that some portion of the saving accruing from the wage reduction will be reflected in prices may have a retarding effect on actual business in the immediate future. Producers make the point that at current low operations the savings will be very small.

Responsive to an even more stagnant situation in demand, steelworks operations this week have eased off three points to 29 per cent, within one point of the low mark set in Labor day week. Only Chicago, Cleveland and Birmingham have held their recent rates. There is, however, the first indication that the steel ingot rate may not be fully responsive to the actual production of finished steel; as, for example, at Chicago ingot production continues at 28 per cent, while structural mills are at 35 per cent, plate mills up 5 points to 30 per cent, and sheet mills at 40 per cent. When consuming demand improves, producers will first pick up their semi-finished stocks, so the gain will not be reflected immediately in the ingot rate.

Strip steel producers at Youngstown note a slight increase in demand, especially from small consumers, and look for a moderately good October and November. Usually an improvement in strip requirements foreruns one in sheets. The market tone at Youngstown is brighter.

An unconfirmed report from Detroit credits a producer with contracting to supply more than 100,000 tons of sheets and strip over an indefinite period to an automotive consumer. All but very few of the automobile companies are ready to order steel for new models for January showing, but the discouraging general business situation is delaying action on these models, and as a consequence current steel requirements continue unchanged at a level indicated by a monthly output of 150,000 to 175,000 units.

The first substantial rail award of the season is that of the Chesapeake & Ohio for 45,000 tons, of which 23,000 tons have been booked by Steel corporation subsidiaries, 15,000 tons by Inland Steel Co., and 7000 tons by Bethlehem Steel Co. Last year the Chesapeake & Ohio bought 58,600 tons.

Structural steel awards are less impressive this week, at 16,437 tons, compared with 89,600 tons in the week preceding. Inquiry also has tapered.

STEEL's composite of steelworks scrap prices is down 8 cents to $8.75; the finished steel composite is unchanged at $48.72; the iron and steel composite remains $31.02.

Composite Market Averages

	Sept. 30	Sept. 23	One Month Ago (Aug., 1931)	Three Months Ago (June, 1931)	One Year Ago (Sept., 1930)	Ten Years Ago (Sept., 1921)
Iron and Steel Composite	$31.02	$31.02	$31.05	$31.02	$32.65	$35.34
Finished Steel Composite	48.72	48.72	48.72	48.60	50.87	54.73
Steelworks Scrap Composite	8.75	8.83	8.70	8.84	12.81	10.97

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. **Finished Steel Composite:**—Plates, shapes, bars, sheets, hot strip, nails, wire, tin plate, pipe. **Steelworks Scrap Composite:**—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Sept. 30, 1931	August 1931	June 1931	Sept. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.26	18.26	20.13
Basic, valley	17.00	17.00	17.00	17.75
Basic, eastern del. eastern Pa.	16.50	16.75	17.00	17.90
No. 2 foundry, del. Pittsburgh	18.26	18.26	18.26	19.13
No. 2 foundry, Chicago	17.50	17.50	17.50	17.50
*Southern No. 2, Birmingham	12.00	12.00	12.00	14.00
**No. 2X, Virginia furnace	18.00	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	17.26	17.51	17.76	19.76
Malleable, valley	17.00	17.00	17.00	18.35
Malleable, Chicago	17.50	17.50	17.50	17.50
Lake Superior, charcoal, del. Chi.	25.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.63	17.63	17.63	18.50
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	103.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.40	2.40	2.40	2.60
Connellsville foundry, ovens	3.25	3.25	3.25	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	29.00	29.00	29.00	31.00
Sheet bars, open-hearth, Pitts.	29.00	29.00	29.00	31.00
Billets, open-hearth, Pittsburgh	29.00	29.00	29.00	31.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00

	Sept. 30, 1931	August 1931	June 1931	Sept. 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.60	1.65	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.89	1.89	1.94	1.89
Iron bars, Chicago	1.70	1.70	1.70	1.75
Shapes, Pittsburgh	1.60	1.60	1.65	1.60
Shapes, Philadelphia	1.76	1.76	1.76	1.66
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.65	1.60
Tank plates, Philadelphia	1.80½	1.80½	1.85½	1.80½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.85	1.85	1.85	2.10
†Sheets, No. 24, hot, ann., Pitts.	2.40	2.40	2.15	2.40
Sheets, No. 24, galvan., Pitts.	2.90	2.90	2.80	3.00
Sheets, No. 10 blue anneal., Chi.	2.00	2.00	2.00	2.15
†Sheets, No. 24, hot, ann., Chi.	2.55	2.55	2.40	2.60
Sheets, No. 24 galvan., Chi.	3.05	3.05	2.95	3.25
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh	1.90	1.90	1.80	2.00
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$10.75	10.70	10.30	15.70
Heavy melting steel, eastern Pa.	8.75	8.55	8.75	13.00
Heavy melting steel, Chicago	7.75	8.25	8.50	12.25
No. 1 wrought, eastern Pa.	9.75	9.75	10.00	14.25
No. 1 wrought, Chicago	8.00	8.25	8.25	11.25
Rails for rolling, Chicago	10.50	10.50	10.90	14.50

Sheets

General Market Continues Quiet; Price Reductions Not Expected from Wage Cut

SHEET PRICES, PAGE 67

Pittsburgh—Sheet orders show no improvement. September business set a new low mark for the year in declining below the August volume. Some seasonal gain had been looked for in demands of several industries but this buying has failed to materialize. Automotive business continues dull and little improvement is looked for during the greater portion of October. Demand for roofing material has shown no seasonal increase, and jobbers also show no disposition to add to stocks. Producers do not anticipate a reflection of wage cuts on sheet prices in view of the fact that quotations have been depressed to a greater extent than on other steel products. They plan to hold to current levels. The market usually is 2.40c, Pittsburgh, for hot-rolled annealed sheets; 1.85c for blue annealed; 2.90c for galvanized, and 3.10c for autobody. Mill operations are lower at slightly above 30 per cent.

Philadelphia—Sheet demand has failed to improve with the approach of the fourth quarter. Sales in the past week actually were lighter than recently. Prices are steady.

New York—While some sheet sellers report a mild improvement, others can see little change in the volume of business. Orders for replenishments are being released slowly. Published prices generally are being adhered to.

Buffalo—Demand for sheets has been somewhat smaller during the past week, with mills now operating at about 30 per cent. No immediate improvement is foreseen here.

Youngstown, O.—The volume of new sheet business is unchanged. Operating rates this week are about on a par with those of the past two weeks, but makers sense an improvement in operations during October and probably November. One encouraging feature is that the trade is entering upon the final quarter, with more steadiness displayed by sheet prices than at any preceding time this year. Buyers apparently have exhausted every effort to obtain lower quotations without success, and now, as at Detroit, are falling back on the stocks of local jobbers.

Cleveland—Specifications are not reflecting further declines, yet there is virtually nothing in sight to drive in orders. Consumers continue to be heard from with minimum requirements. The firm price situation is the most noteworthy in years. A little tonnage is being entered on mill books for fourth quarter rolling, though hesitancy in contracting is noted. A rumor is current of an extremely large order for sheets and strips, mainly the former, placed with a mill to south of here by two large automobile manufacturers in the Detroit district.

The order is supposed to have called for enough material for over 700,000 automobiles.

Cincinnati—Sheet mills in this district are looking forward to larger demand from the automobile industry. Production is holding at about 40 per cent. Prices remain steady.

Chicago—Sheet mill operations are continuing at 40 per cent. Little fourth quarter buying has developed. Spot business in No. 10 blue annealed and No. 24 galvanized is on the basis of 1.95c and 3.00c, mills, respectively.

Five mills of the 10-mill Milwaukee unit of the leading independent are active, but may go down in a few days.

St. Louis—Sheet business continues quiet. September probably represents the low point of the year, both in shipments and new orders. Prices are strong.

Birmingham, Ala.—The two large sheet mills in this district continue operating slightly above 50 per cent. Demand for sheets for building construction is fair.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

HOT ROLLED No. 10

Pittsburgh base	1.70c
Gary, Ind. Harbor, base	1.80c
Chicago, del.	1.85c
Philadelphia, del.	1.99c
Birmingham, base	1.85c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.85c
Chicago, district mills	1.95c
Chicago, delivered	2.00c
Philadelphia, del.	2.14c
St. Louis, delivered	2.20½c
Birmingham	2.00c to 2.05c
San Francisco, c.i.f.	2.50c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.40c
Gary, Ind. Harbor, base	2.50c
Chicago, del.	2.55c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.75½c

GALVANIZED No. 24

Pittsburgh, base	2.90c
Gary, Ind. Harbor, base	3.00c
Chicago, del.	3.05c
Philadelphia, base	3.19c
Birmingham, base	3.05c
St. Louis, del.	3.25½c

AUTOMOBILE No. 20

Pittsburgh, base	3.10c

FURNITURE

Pitts., No. 10 heavy	2.75c
Pitts., No. 20 light	3.35c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary base	2.75c
St. Louis, del.	2.90½c

HEAVY COLD ROLLED No. 10

Pittsburgh base	2.35c
Gary, Ind. Harbor, base	2.45c
Chicago, del.	2.50c
Philadelphia, del.	2.64c
St. Louis, del.	2.70½c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, Ind. Harbor, base	3.05c
Chicago, del.	3.10c
Philadelphia, del.	3.24c
St. Louis, del.	3.30½c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00
Gary, Ind., base 10 cents higher.	
Long ternes 24, unassorted, lb.	3.15c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c
Woven wire fencing, (9-11 ga.)	$55.00 and $60.00
(12½ ga. and lighter)	60.00 and 65.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.50c
Struc., c.l., Chicago	2.60c
7/16-in. smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70, 10 and 5 off

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.80½c
New York, delivered	1.88c
Boston, delivered	2.00c
Chicago, base	1.70c
Cleveland, base, for railroads	1.65c
Lackawanna, N. Y., base	1.70c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	1.85c to 1.95c
St. Louis, del.	1.95½c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.76c
New York, del.	1.85½c
Boston, del.	1.98½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.05c to 2.15c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c to 2.05c
Cleveland, base, local del.	1.65c
Cleveland base, out. del.	1.65c
Philadelphia, del.	1.89c
New York, del.	1.93c
Boston, del.	2.00c
Pittsburgh, cold finish	1.85c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.60c
Eastern mills	1.30c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.70c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.75c
Stock lengths, mill	1.60c
Chi., billet	1.60c to 1.80c
Chi., rail steel	1.35c to 1.60c
Chi., rail steel, bridge and culvert	1.60c to 1.65c
Philadelphia, cut lengths	1.94c to 1.95c
Cleveland, cut lengths	1.75c

Cold Finished Bars, Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, Pittsburgh, Cumberland, Md.	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	7.00 to 7.45 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bars, 2.65c, mill

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.80	Cr., Ni., Van.	1.50
4100 .15 to .25		Carbon Van.	0.95
Mo.	0.50	9250 (flats)	0.25
4600 .20 to .30 Mo.		9250 (rds.,sq.)	0.50

Strip, Hoops Bands

Hot strip, to 6-in., Pitts.	1.65c
Do, 6 1/16 to 24-in., Pitts.	1.55c
Hot strip, bands 6 in. and under, Chicago	1.75c
Do, 6 1/16 to 24 in.	1.65c
Cooperage hoop, Pitts.	1.70c to 1.80c
Do, Chicago	1.85c to 1.95c
Cold rolled strip, Pitts., Cleveland	2.15c to 2.25c
Worcester, 3 tons, over	2.30c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$22.00 to $26.00
50 to 75	20.00 to 24.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.70c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.70c
Spikes boat, barge, Pitts.	2.90c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do, standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 and 10 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.	
Eagle list	73 and 10 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 and 10 off
Tire bolts	60, 10 and 10 off
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.	
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.	

NUTS

Semifinished	73 and 10 off

HEXAGON CAP SCREWS

Milled	80-10-10-5 off
Upset 1 in. diam. and smaller	85-10 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. and smaller	80-10-5 off
Upset, larger than 1 in.	80-5off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh 2.50c

Do, less carloads, 5 kegs or over, 2.75c; less than 5 kegs 2.90c.

Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Small Demand from Automotive Industry Depresses Market—Fourth Quarter Buying Light

BAR PRICES, PAGE 67

Chicago—With a slow demand for cold-finished bar products in the automotive parts field, deformed bars continue to lead in shipments, and 30 per cent bar mill operations are maintained. Schedules indicate moderately heavier specifications next month, despite little automotive promise. Attractive business probably would bring out concessions below the 1.70c, Chicago, base, as many consumers still see possibility of lower prices following more general steel wage reductions. Possibility of price cuts soon on farm equipment is expected to develop fresh business and resumption of implement operations on a small scale. A number of concerns in a position to accumulate stocks of finished goods plan to start up in November to reduce unemployment among laid-off forces.

New York—Bar orders comprise a better tonnage, although the improvement is not marked. Commercial steel bars are 1.60c, Pittsburgh; common iron bars, 1.60c to 1.70c.

Philadelphia—Steel bars are steady at 1.60c, Pittsburgh, with light buying mostly for nearby delivery. Iron bars are 1.60c to 1.70c, Pittsburgh.

Pittsburgh—Steel bar business during September showed little change from the August volume. Miscellaneous demand improved silghtly in some directions, but the automotive industry reduced its requirements. Producers usually are naming 1.60c, Pittsburgh, on what new business is being placed although fourth quarter contracting is light.

Cleveland — Merchant steel bar specifications reflect anything but improvement, yet hold to a weekly minimum that in itself is somewhat steady. Operations among this district's manufacturers taking bar stock are still of a depressed nature. Automobile forging shops continue to be in the same category of restricted commitments. The 1.65c, Cleveland, base is firm for both local and outside delivery on current small-lot orders.

Cold-Finished September Demand at Low for Year

Cold Finished Prices, Page 67

Pittsburgh—Cold-finished bar shipments and new business continue quieter than a month ago and September business marked a new low level for 1931 to date. Outlook for the automotive industry in October is poor and little improvement in demand is looked for from that industry until late in the month. Requirements of other industries are unchanged and generally dull with the possible exception of textile and shoe machinery builders. Contracting is being done at the recent market of 2.10c, base, Pittsburgh.

Cleveland—Neither specifications nor inquiries have expanded this week, with the result commitments are in the same relatively depressed state as heretofore. Automotive parts manufacturers in this district are heard from only occasionally, other branches of activity are dull. The 2.10c, Cleveland, base is fairly firm on new quotations.

Tin Plate Demand Slower; Price Cut Anticipated

Tin Plate Prices, Page 67

Pittsburgh—Tin plate activity continues to moderate gradually with operations now slightly above 40 per cent, against 45 per cent recently. September shipments were slightly smaller than those of August and new business also is lighter. Estimates on the packs of corn, tomatoes, peas and beans place the 1931 total at slightly less than 25 per cent below the 1930 pack. A reduction of 40 per cent is expected in tomatoes while the pack of corn is likely to approximate the 1930 total. Tin plate continues $5, Pittsburgh, per base box, although there are reports of a probable reduction before the end of the year.

Plates

Chicago Mills Advance Operations Five Points—More Tank Work Nearing Active Stage

PLATE PRICES, PAGE 67

Chicago—With the start in the rolling of 48,200 tons of structural material for the Chicago postoffice, plate mill operations have risen 5 points to 30 per cent. Occasional short-term plate contracts are made on the 1.70c, Chicago, base. No important tank work has been let, while about 12,000 tons are potentially active in the Mid-Continent, East Texas and Pacific coast oil fields.

New York—Plate prices at 1.70c, Coatesville, Pa., continue easy. Buying is from hand to mouth, with little consuming interest in forward requirements. Tank and pipe work is negligible, and delay attends the placing of shipbuilding contracts.

Philadelphia—Plate prices are easy. Action may be taken this week on the award of 11 destroyers for the navy. Indications are that five will go to a navy yard, and two each to the Bath Iron Works, United Dry Dock Co., and Bethlehem Shipbuilding Corp. The Baldwin Locomotive Works has awarded 350 tons of fabricated plates for separators for a coal breaker at Scranton, Pa.

Pittsburgh—Plate demand is quiet and unchanged, with September business lacking in improvement over the August volume. Orders for tanks and river equipment are light and action on pending work in the latter is slow to develop. Producers are naming 1.60c, Pittsburgh, on fourth quarter business, although little inquiry is appearing.

Cleveland—Specifications still are meager. The 1.60c, Pittsburgh, base is firm, and is being affirmed on all projects carrying into fourth quarter. An eastern shipbuilding interest is advertising here for 600 riveters to work off large unfilled orders. D. W. McGrath & Sons Co., Columbus, O., has the contract at $152,041 for a standby tank, Alum Creek, Columbus, O.

Contracts Placed

600 tons, 3/16 and ¼-inch tunnel liner plate, Cle Elum federal project, Washington, to Truscon Steel Co., Youngstown, O.; Winston Bros., Minneapolis, general contractors.

450 tons, pipe line dredge for United States engineers, St. Louis district, to Dravo Contracting Co., Pittsburgh.

400 tons, tanks and storage terminal equipment for Liberty Petroleum Co., Linnton, Oreg., and Fletcher Oil Co., Vancouver, Wash., to Steel Tank & Pipe Co., Portland, Oreg.

Contracts Pending

Unstated tonnage, Alum creek standby tank, Columbus, O.; D. W. McGrath &

Sons Co., Columbus, contractor at $152,041.

Wage Cut Is General; Zone Plan Is Set Up

(*Concluded from Page* 16)

the identical establishments in July, 1930, mainly a reflection of curtailed working time.

The National Industrial Conference board's index of the cost of living in August this year was 9.3 per cent lower than in August, 1930. The index is down 14 points from August, 1923, when the steel wage rates just discarded were established.

At Washington, the attitude of administration leaders — President Hoover would not comment—was summed up in the statement by Secretary of Labor Doak that the wage cuts are "deplorable."

Walter S. Gifford, director general of the President's employment relief committees, who also is a director in the Steel corporation, reiterated "we ought to make every effort to maintain the wage scale."

Some efforts to organize steel workers are being made at Pittsburgh, where William Z. Foster, leader of the radicals in the strike of 1919, is speaking of "local strikes against wage cuts and speedups."

Ask Chicago Building Trades To Take Cut

Chicago—Union building mechanics are being asked by Chicago employers to accept at least a temporary wage cut to permit work to go ahead on a proposed city-wide program of modernization of old structures. Edward M. Craig, executive secretary of the Building Construction Employers' association, declares that the immediate future of Chicago's building industry holds no worth-while encouragement, aside from public construction work, and that if a wage reduction is accepted, it need only apply at this time on the modernization work that is planned.

Morse Chain Books Orders

Morse Chain Co., Ithaca, N. Y., division of the Borg-Warner Co., Chicago, has received orders from six large automobile manufacturers in the past month for timing sprockets and chains to be used as standard equipment.

Railroads

Chesapeake & Ohio Rails Placed—New York Subway Cars Near Award

TRACK MATERIAL PRICES, PAGE 67

New York — American Car & Foundry Co. is low on 300 to 1500 subway cars for the local board of transportation. Apart from this and the opening of bids by some railroads in this district on fourth-quarter steel requirements, the railroad market remains decidedly dull.

No competitive bidding on lots of over 500 cars makes it appear assured that not over this number of subway cars will be purchased by the board of transportation. This number would require approximately 8500 tons of rolled material, including a substantial tonnage of sheets and 1500 tons of H axles. On the basis of 300 cars, prices are about 27 per cent under a similar lot awarded American Car & Foundry Co. in October, 1929. About 100 freight cars are pending, the largest list involving 50 units.

Philadelphia—Pennsylvania railroad has placed orders for the construction of chassis and mechanical parts for 60 freight locomotives for which the electrical equipment was awarded six months ago. Parts include driving wheels, axles, trucks, frames and cabs. Lima Locomotive Works, Lima, O., will build 30, Westinghouse Electric & Mfg. Co., Eddystone, Pa., 10, and the Pennsylvania railroad 10 in its shops, Altoona, Pa. The contract involves $2,500,000.

Pittsburgh—The market for railroad equipment is extremely dull. Specifications against old orders are light and smaller than a month ago, while new business is lacking. Inquiry is deferred on track equipment and little activity is appearing in the car market. Light rails are moving slowly. Relaying rails also are dull. Offerings of the latter are fairly plentiful but prices are steady.

Chicago — Moderately brighter prospects again exist in the steel rail market, due to further releases for October and the award of the Chesapeake & Ohio rails. While it appeared recently that rail mill operations would have to go down by Oct. 1, fresh schedules give virtual assurance that October rail mill production can be maintained at probably 25 per cent. Fair releases for track supplies have occurred and a pick-up is expected early in October.

Cleveland—Chesapeake & Ohio has placed 45,000 tons of 110 and 130-pound steel rails among four mills. To two of the United States Steel Corp. subsidiaries was allocated 23,000 tons; Inland Steel Co. took 15,000 and Bethlehem Steel Co., 7000 tons. The inquiry had been before the market for about two weeks and was allocated somewhat sooner than anticipated. This total compared with 58,600 tons bought last year.

Car Orders Placed

Atchison, Topeka & Santa Fe, one combination baggage and mail gasoline-electric rail motor car, to J. G. Brill Co., Philadelphia.

E. I. du Pont de Nemours Co., one narrow tank car to General American Tank Car Corp., Chicago.

Pennsylvania railroad, mechanical parts and chassis for 60 freight locomotives for which electrical equipment was placed last spring, allocated as follows: Lima Locomotive Works, Lima, O., 30 units; Pennsylvania railroad, Altoona, Pa., shops, 10 units; Westinghouse Electric & Mfg. Co., Eddystone, Pa., 20 units.

Rail Orders Placed

Chesapeake & Ohio, 45,000 tons, 110 and 130-pound rails, allocated as follows: United States Steel Corp. subsidiaries, 23,000 tons; Inland Steel Co., 15,000 tons; Bethlehem Steel Co., 7000 tons.

Seattle municipal street railway, 500 tons 87-pound, 7-inch plain open-hearth steel girder rails, to Pacific Coast Steel Corp., Seattle.

Car Orders Pending

Board of transportation, New York, 300 to 1500 subway cars; American Car & Foundry Co., New York, low.

Where Sheet Iron Goes

Washington—Analyzing sales in 1929 by manufacturing plants in the copper, tin and sheet iron work industries, the bureau of the census finds 23.3 of sales was made to hotels, municipalities, home and building owners, 17.4 to contractors and public utilities, 17.3 to manufacturers, 15.1 to retailers, 18.9 to wholesalers and 8 to manufacturers owning wholesale branches. The total sales by the plants analyzed in 1929 totaled $206,285,000.

Discover Siberian Ore

Near Kuznetzstroy one of the largest Siberian iron ore deposits has been discovered by Russian scientists, rendering out of date all previous estimates of Russian ore.

Structural Shapes

Awards Less After Last Week's Activity — 6300-Ton Garage and Church Leads— Inquiry Limited at Chicago —New York Jobs Slow Closing

STRUCTURAL SHAPE PRICES, PAGE 67

New York—New York Central will construct a warehouse here to take approximately 7500 tons of structural material. The same interest closed this week on about 3000 tons of shapes for other construction. While considerable structural business here is in sight, current purchasing is slow. Shapes are held at 1.70c, eastern mill.

Philadelphia — Protections on structural material at lower prices are fairly well cleaned up, imparting certain strength to the 1.70c, eastern mill, base. New inquiry is light.

Pittsburgh—Inquiry and awards have declined to a new low level in the fabricated structural steel market. Pending work also is light, but specifications for plain material are sustained somewhat by work on old orders. This is particularly true among the larger fabricators. Plain shapes are quoted 1.60c, Pittsburgh, which is being continued in the fourth quarter.

Cleveland — Specifications against contracts are fairly well maintained, but new projects for figuring are slow to develop. The 1.60c, Pittsburgh, base on plain shapes is well observed. Plans have just been issued on the sub-mall exposition hall.

Chicago—Inquiry in this area and at western points is limited to about 5000 tons, including several small projects on the coast. A few utility jobs are included. Further concessions in prices of plain material, not including wide flange beams, are made for occasional individual projects, although a few contracts, covering about 30 days, have been signed on the basis of 1.70c, Chicago. Opinions differ as to whether the steel wage cuts will result in more extended pressure against the structural steel pice. Structural mill operations are up 5 points this week to 35 per cent of capacity.

Birmingham, Ala. — Fabricating shops are down a little, now on four days a week. Contracts are a little more numerous but for small lots.

Contracts Placed

6300 tons, church and apartment, Broadway and 173rd street, New York, to George A. Just Co., Long Island City, N. Y.

3000 tons, bridge over St. Lawrence river between St. Gregoire de Montmorency and St. Petronille de l'Ile d'Orleans, to Eastern Canada Steel & Iron Works Ltd., Quebec, Que.

1200 tons, bridge, Hornell, N. Y., for the Erie railroad, to Mt. Vernon Bridge Co., Mt. Vernon, O., through Newhall Co., Cleveland, contractor.

700 tons, building for Wall Street Journal, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

600 tons, buildings for Lever Bros., Edgewater, N. J., to Jones & Laughlin Steel Corp., Pittsburgh.

580 tons, reformatory for men, Howard, R. I., to Lehigh Structural Steel Co., Allentown, Pa.

385 tons, addition to Reid Ice Cream Co. plant, 141st street, New York, to Lehigh Structural Steel Co., Allentown, Pa.

370 tons, bridge, Sheldon Junction, Vt., for St. Johnsbury & Lake Champlain railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

350 tons, station for Canadian National Railways, St. John, N. B., to St. John Drydock & Shipbuilding Co., St. John.

300 tons, addition, Montreal General hospital, Montreal, Que., to Dominion Bridge Co. Ltd., Lachine Locks, Que.

265 tons, New York Rapid Transit Co. elevated platform, Linden boulevard, Brooklyn, N. Y., to National Bridge Co., Long Island City, N. Y.

265 tons, public school additions, Baraga and Wakefield, Mich., to Worden-Allen Co., Milwaukee.

262 tons, electrification work for Pennsylvania railroad, to Belmont Iron Works, Philadelphia; 190 tons through Gibbs & Hill, New York, 72 tons through Vare Construction Co., Philadelphia, contractors.

250 tons, postoffice, Penetanguishene, Ont., to Reid & Brown Structural Steel & Iron Works, Toronto, Ont.

250 tons, separators, west end coal breaker, Scranton, Pa., to Frank Weaver Co., Lansdale, Pa. McCarter Iron Works, Norristown, Pa., awarded 90 tons fabricated plates for this project.

230 tons, plant for Borst-Foster-Dixfield Co., Boston, to Lyons Iron Works, Manchester, N. H.

225 tons, gas office building, Royal Oak, Mich., to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, bridge for Wabash railroad, near St. Louis, to American Bridge Co., Chicago.

150 tons, highway bridge, Massachusetts, to American Bridge Co., Pittsburgh.

130 tons, bridge for Wabash railroad, Conception, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

125 tons, railroad bridge for Western Maryland railroad, to American Bridge Co., Pittsburgh.

100 tons, plant, Galion, O., for Gledhill Road Machinery Co., to J. W. Hoffman, Mansfield, O., through T. J. Shirtzinger, Columbus, O., contractor.

100 tons, highway bridge, Erie county, N. Y., to Lackawanna Steel Construction Co., Buffalo.

100 tons, approximately, institutional group, Palmetto street, New Orleans, to Virginia Bridge & Iron Co., Roanoke, Va., through George J. Glover Co. Inc., New Orleans, contractor.

Awards Compared

	Tons
Awards this week	16,437
Awards last week*	89,700
Awards two weeks ago	36,072
Awards this week in 1930	14,387
Av. weekly awards, 1930	35,242
Av. weekly awards, 1931	37,382
Av. weekly awards, Sept.	62,558
Total awards to date, 1930	1,421,345
Total awards to date, 1931	1,495,295

*Revised

Contracts Pending

8000 tons, dirigible hangar for navy department, Sunnydals, Calif., Wallace Bridge & Structural Steel Co., Seattle, low.

7500 tons, warehouse, New York, for New York Central railroad.

1500 tons, highway bridge, Lane county, Okla.; bids soon.

600 tons, gymnasium, Westwood, Calif.

500 tons, school, Queens, N. Y.

400 tons, highway bridge, Muskegon, Mich.

400 tons, school, Union City, N. J.

400 tons, school No. 242, Brooklyn, N. Y.

370 tons, postoffice, Altoona, Pa.; bids opened Sept. 18, general contract not yet awarded.

300 tons, state highway bridges, New York.

250 tons, First Congregational church, Lexington and Eightieth streets, New York.

247 tons, bridge, Irwins, N. Y., for Erie railroad.

230 tons, school, Fieldston, N. Y.

200 tons, theater, Washington, for Crandall Theaters Inc.

200 tons, state bridges, New Hampshire.

200 tons, postoffice, Niles, O.; bids close Oct. 15. Supervising architect, treasury department, Washington, architect.

185 tons, bridge, Croxton, N. J., for Erie railroad.

128 tons, bridge, Hanafer, Utah; bids opened.

The Cincinnati Milling Machine Co., Cincinnati, was host to the Cincinnati Foreman's club recently, sponsoring a dinner and an inspection trip through the plant. Fred A. Geier, president of the company, and H. W. Koller, club president, made addresses.

Concrete Bars

New Orleans Canal Placed—Illinois Roadwork Status Still Uncertain—September Business Off Moderately—Pending Total Up Slightly To 9105 Tons

REINFORCING BAR PRICES, PAGE 67

Chicago—Contracts for 12 Illinois reinforcing bar road paving, grading and bridge construction jobs, including 290 tons of paving work, were let Sept. 23 at Springfield, Ill. Status of road and bridge work let on Sept. 8 is uncertain because of a circuit court decision holding unconstitutional the Illinois prevailing wage law. This affects nearly 1000 tons of reinforcing bars, besides 26 miles of grading and 20 bridge sections. Reinforcing bar prices are nominal except for road and bridge work.

Philadelphia — Reinforcing bars are softer at 1.50c to 1.55c, Pittsburgh, on stock lengths, the inside figure being more representative. Rail steel is 1.30c, eastern mills. This week's business is featured by the placing of 800 tons for two Baltimore bridges.

Buffalo—Reinforcing bar demand continues on a fairly satisfactory basis, with one order for 250 tons booked locally during the past week and several others of medium size still pending. Belated construction activity is counted on to give the final quarter a good start in the sale of bars.

Pittsburgh — September business declined moderately from that of August despite a slight improvement in specifications late in the month. Additional seasonal decline is anticipated for October, although a fair volume of business remains pending. New inquiry is light. Prices are only fairly firm at 1.60c for stock lengths and 1.75c for cut lengths.

Cleveland—The several good-sized projects before district fabricators are slow going to awards. Plans are out for the underground exposition hall. E. H. Latham Co., Columbus, O., contractor, will purchase the steel for the Bedford, O., grade crossing, and Hecker-Moon Co. are contractors on the Nine Mile creek development, locally.

Contracts Placed

2900 tons, locks for intercoastal canal, New Orleans, to Jones & Laughlin Steel Corp., Pittsburgh; R. F. Fowler, major, United States Engineering Corps., in charge of construction.

800 tons, Bohemia river and Marshy Hook bridges, Baltimore, to Kalman Steel Corp., Bethlehem, Pa., through Sanford & Brooks, Baltimore.

250 tons, public utilities building, Syracuse, N. Y., to unstated Buffalo producer.

225 tons, postoffice, Cedar Rapids, Iowa, to Laclede Steel Co., St. Louis.

222 tons, institutional group, Palmetto street, New Orleans, to Truscon Steel Co., Youngstown, O., through George J. Glover Co., Inc., New Orleans, contractor.

140 tons, court house, Clarksburg, W. Va., to Kalman Steel Corp., Bethlehem, Pa., through Hutter Construction Co., Fond du Lac, Wis.

136 tons, board of public works, Sheboygan, Wis., to Concrete Engineering Co., Omaha, Nebr.

100 tons, warehouse for Great Atlantic & Pacific Tea Co., Chicago, to Inland Steel Co., Chicago.

100 tons, building, Indianapolis, for Sears, Roebuck & Co., Chicago, to Hugh J. Baker Co., Indianapolis.

100 tons, Illinois road work, to Olney J. Dean & Co., Chicago.

Contracts Pending

1900 tons, Madden dam, Panama canal; Peterson, Shirley & Gunther, Omaha, Nebr., contractors. Works also includes 90 tons structurals for power plant adjoining.

1500 tons, substructure, postoffice building, Washington, and foundation, interstate commerce building; McCloskey & Co., Philadelphia, contractor on both projects.

1400 tons, double conduit sewer, Nine Mile creek from St. Clair avenue to East 152nd street, Cleveland; Hecker-Moon Co., Cleveland, contractor; bids readvertised from Aug. 19.

1100 tons, breakwater, Santa Monica, Calif.; bids soon.

930 tons, grade crossing elimination, Bedford, O.; E. H. Latham Co., Columbus, O., contractor.

600 tons, gymnasium, University of California, Los Angeles; bids being taken.

400 tons, hangar, Sunnyvale, Calif.; bids opened.

350 tons, municipal bridge, University avenue, Philadelphia; bids Sept. 30.

300 tons, two unnamed projects, Philadelphia; one for 170 tons, the other for 130 tons.

200 tons, substructure, department of justice building, Washington; Ceisel & Co., Milwaukee, contractor.

200 tons, bridge, Walnut street, Philadelphia; bids Oct. 7.

125 tons, reservoir, Helena, Mont.; bids Sept. 28.

100 tons, highway work, Monterey county, Calif.; bids Oct. 14.

Awards Compared

	Tons
Awards this week	4,981
Awards last week	2,554
Awards two weeks ago	11,239
Awards this week in 1930	11,422
Av. weekly awards, 1930	6,999
Av. weekly awards, 1931	6,908
Av. weekly awards, Sept.	6,672
Total wards to date, 1930	281,086
Total awards to date, 1931	276,336

Illinois Law Holds Up Road Work

Chicago—A further tie-up of reinforcing bar and structural steel projects for bridge and highway construction in Illinois, for the third time this season, may occur because of the vexing prevailing wage law enacted several months ago by the legislature. The law has been held unconstitutional in an opinion of Circuit Judge Charles G. Briggle, at Springfield, Ill., and the case now comes to the Illinois Supreme Court for a test of the law's ultimate constitutionality.

The opinion was given in a taxpayer's test suit, and the case will be speeded for the October term of the state's high court. Illinois highway department officials will confer with representatives from the state attorney general's office to determine what steps to follow, in the light of the ruling by Judge Briggle.

Approximately $3,000,000 in road work, on which bids were received Sept. 15, has not yet been contracted for, and the state will seek guidance on what course to follow. The state already has awarded general contracts on a large share of the $4,543,161 letting of Sept. 8, and the status of this work also is subject to a ruling from the attorney general. The Sept. 8 letting included 98.6 miles of paving, calling for more than 900 tons of rail steel reinforcing bars, 26 miles of grading, and also 20 bridge sections.

Work may go ahead on awards already made, it is stated, pending action by the Illinois supreme court, provided the question of legality is not raised in the new litigation. The law was held unconstitutional in the circuit court on the ground that it interferes with the right to contract; that the law is vague and does not prescribe proper procedure for the appeal board; that it deprives persons who desire to labor of that privilege; and that it is class legislation.

Strip

Sales Volume Below August as Buyers Delay Covering—Prices Hold Fairly Steadily

STRIP PRICES, PAGE 67

Pittsburgh—Strip steel sales are slow and unimproved, with September business moderately smaller than that of August. Orders from the automotive industry are small and little improvement is looked for until late October. Prices are well maintained on new business with 1.55c and 1.65c the market for hot strip while cold-rolled strip is 2.15c to 2.25c. Production is spotty, schedules being made up for only a short time ahead. The general average for hot mills is around 20 per cent, with cold mills at 15 per cent.

New York—A mild improvement in strip business has been in evidence here for the past two weeks. Demand still is greatly restricted, but sellers are hopeful that improvement will continue into October. Hot strip is unchanged at 1.55c and 1.65c, Pittsburgh, and cold-rolled strip at 2.15c, Pittsburgh.

Philadelphia—Less activity is manifested in steel strip, but prices are unchanged at 1.55c to 1.65c, Pittsburgh, for cold-rolled and 2.15c, Pittsburgh, for cold-rolled.

Youngstown, O.—Buying of hot-rolled strip has picked up to an encouraging degree and is being followed by cold-rolled. Partsmakers again are becoming interested in deliveries, indicating revival in the automotive industry. Since strip buying usually precedes sheet buying by several weeks, this movement is regarded by sheet makers as significant for the immediate future.

Cleveland—Unchanged prices on strip for fourth quarter are well received by consumers. Current business is light, minimum requirements from most customers' orders scheding greatly reduced operating schedules. Hot-rolled strip is 1.55c and 1.65c, Pittsburgh, depending on width. Cold-rolled strip is featureless and in dull demand at 2.15c, Cleveland minimum.

Chicago—Cold-rolled stripmakers see little possibility of increasing shipments to the Detroit automotive market the first half of October. Few fourth quarter contracts have been made, and 2.15c, Pittsburgh-Cleveland, is nominal.

Panama Canal Takes Bids

New York — United States Steel Products Co. is low on 2570 galvanized steel sheets for corrugated roofing for Panama with a bid of $3,647-.49. W. Ames & Co., Jersey City, N. J., is low on 50,000 pounds of track spikes. Bids on 10,000 pounds of track bolts were cancelled. Crescent Insulated Wire & Cable Co., Trenton, N. J., is low on 2000 feet of copper cable at $1194 and General Electric Co., Schenectady, N. Y., on 16,000 feet at $1720. U. S. Electric Export Co., New York, at $4390, is low on 100,000 feet of rigid steel conduit.

Operations Sag 3 Points To Average 29 Per Cent

Youngstown, O.—Ingot production is down nine points from last week to 30 per cent of capacity. Twenty-two open hearths of 66 are melting, against 26 last week. Republic Steel activity is unchanged at 35, Sheet & Tube is down 10 points to 25, Carnegie Steel is down five points to 35 and Sharon Steel Hoop is unchanged at 20 per cent ingot capacity engaged. Blast furnace operations, with seven blowing for four steelmakers, are unchanged.

	Per Cent
Operations this week	29
Operations last week	32
Operations two weeks ago	32
Operations this week, 1930	56
High for 1931, (March 19)	57
Low for 1931, (Sept. 8)	28

Philadelphia—Eastern ingot production is off a point from last week and is now at 30 per cent of capacity. A leading mill here is at 30-31 per cent, off fractionally.

Buffalo—District steelworks operations are down six points this week to 35 per cent of capacity, due to the "off" week at the local Republic Steel Corp. plant. There are 13 open hearths making steel out of 37 in the district.

Pittsburgh—Ingot production continues to decline now being down three points this week to barely above 25 per cent. Blast furnace schedules remain at their lowest level of nine active stacks out of 54 steelworks furnaces. Changes in finishing mill operations are downward, with sheets and tin plate lower at around 30 and 40 per cent respectively. Strip holds around 20, pipe at 25 to 30.

Cleveland—Open-hearth schedules are continued into this week at the same rate as last with 12 furnaces of a possible 34 melting, or at 35 per cent rate. Each of the district's four mills is unchanged. Nine independent open hearths are active.

Chicago—Ingot production is continued at 28 per cent, and finishing mill operations show virtually no change. Active steelworks blast furnaces number nine of 36.

Birmingham, Ala.—Ingot production is being held around 30 per cent of capacity, nine open-hearth furnaces in operation. Six furnaces at Fairfield and three at Gadsden are making steel.

Warehouse Sales Slow; Hopes Held for Gains

Warehouse Prices, Page 89

Pittsburgh—Sales still lack seasonal improvement, business for some being smaller in August, the poorest month of 1931. Prices are irregular on some products though no changes have been made in official quotations.

Philadelphia—Business in September was on a parity with August, making the fourth consecutive month of light but even trading. Disappointment is manifested that a seasonal rise did not appear, yet continued steadiness is taken as indicating the low is being touched.

Cleveland—Sales present discouragement in that no expansion over August was recorded in September, demand from week to week continuing to be approximately of the same proportions as during the summer months. Most products down the warehouse list seem so affected. Prices are unchanged.

Cincinnati—Materials are moving at an unimproved rate; demand for September was little better than in August. Individual orders continue light. Prices are unchanged.

St. Louis—While reporting business unusually dull during September, warehouses report outlook for the next month or six weeks more promising than at any time since last spring. The improvement is noted principally in the general manufacturing demand.

Sunset Machinery Corp., Seattle, has changed its name to MacCammon Machinery Corp.

Pipe

General Contract Placed on 12,000 Tons Cast, Lincoln, Nebr.—Steel Pipe Inactive

PIPE PRICES, Page 89

Pittsburgh—Demand is made up mostly of small miscellaneous orders. Little business in large individual lots is pending in line pipe, while standard pipe has failed to show its anticipated seasonal improvement. Oil country goods continue quiet. Tubes and tubing are moving in light volume.

New York—Merchant pipe resale market is stronger with producers establishing 60 per cent off the list as the minimum on consignment stocks.

Chicago—Several fair sized public utility orders for cast pressure pipe are being placed, amounting to 2000 tons. General contract has been awarded for 12,000 tons of 36-inch pipe for Lincoln, Nebr., purchase to be concrete, cast, or both. Bids will be received Oct. 1 for 12,000 feet of 2 to 6-inch pipe for Ambia, Ind. Ironwood, Mich., has awarded 3600 feet of 6 to 10-inch pipe. Chicago delivered quotations for the larger cast diameters are $40 to $43.

Birmingham, Ala.—Pipe demand is light, new lettings are scarce and backlogs are being worked down. Shop operations are under 40 per cent of capacity. Specifications in sight are encouraging.

Cast Pipe Placed

1380 feet, 6-inch; 1800 feet, 8-inch; and 324 feet, 10-inch; class C water pipe, for Ironwood, Mich., to McWane Cast Iron Pipe Co., Birmingham, Ala., at $3168.98.

350 tons, 4, 8 and 16-inch centrifugal steel water pipe for Ann Arbor avenue project, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.

347 tons, 4 to 10-inch class 150, Fresno, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

12,000 tons, 36-inch, concrete or cast pipe for Lincoln, Nebr.; general contract to Abel & Dobson, Lincoln, Nebr. Lock-Joint Pipe Co., low bidder on concrete.

12,000 feet, 2, 4 and 6-inch for Ambia, Ind.; bids Oct. 1.

1644 tons, 4 to 8-inch class B or 150 or 260, Oakland, Calif., bids Oct. 5.

500 tons, miscellaneous pipe for Jackson, Mich., sewage treatment works; bids soon.

139 tons, 4 to 8-inch class B, Anaheim, Calif., American Cast Iron Pipe Co., Birmingham, Ala., low.

Steel Pipe Pending

1000 tons, steel casing, for export to South America.

How wholesalers can best assist retiler in conduct of their business will be one of the most important subjects discussed by the National Hardware Association of the United States at its thirty-seventh annual convention at the Palmer house, Chicago, Oct. 19-22.

Conference Board Sees Obstacles to Job Insurance

Unemployment benefit and insurance plans, unless coupled with other measures for preventing unemployment, offer only a temporary palliative and not a permanent remedy, according to the National Industrial Conference board, New York.

One of the chief difficulties found in applying insurance to unemployment is that hardly any plan meets the requirements of an insurable risk. Insurance must be effected on a mathematical basis, but the conditions that determine most types of unemployment do not permit such computation. The board states it would require data extending 50 years or more to lay the actuarial basis for a fair average of depressional unemployment.

Another difficulty is said to be that payment of benefits tends to create more unemployment through the psychological response of wage earners to the opportunities held out by insurance, so that the risk is increased by the very effort to cover it by insurance.

Railroad Buying Would Lift Steel Output Third

"To restore normal railroad buying of steel products immediately would increase present output of the steel mills at least 30 per cent," William H. Williams, president, Wabash railroad, told the Trans-Missouri-Kansas Shippers' board at St. Louis, recently. The statement was made in connection with a discussion of the favorable aspects of the proposed freight rate increases.

"The stimulus," Mr. Williams added, "would extend to the railroad equipment industry, to the cement plants, to the stone quarries and to the mines and forests. Shops now closed down would be reopened and there would be a definite check in the mounting roll of the unemployed. Labor would at once increase its earning power and there would be an increase in buying power throughout the nation."

Air-Conditioned Pullmans May Widen Steel Market

Successful experimentation by the Pullman Car & Mfg. Corp, Chicago, in air conditioning has led to the belief next summer will see a number of trains running with the new equipment.

Test cars have been operated during the summer and have maintained car temperatures of 76 to 88 degrees, against outside temperatures of 100 to 113 degrees. Various equipment has been tested, including a water-spray system. Another method under development makes use of steam jets. It is reported that the engineering phase of the research has been successfully accomplished.

Steel is the principal metal used.

Toolmakers Sell Most To Wholesale Dealers

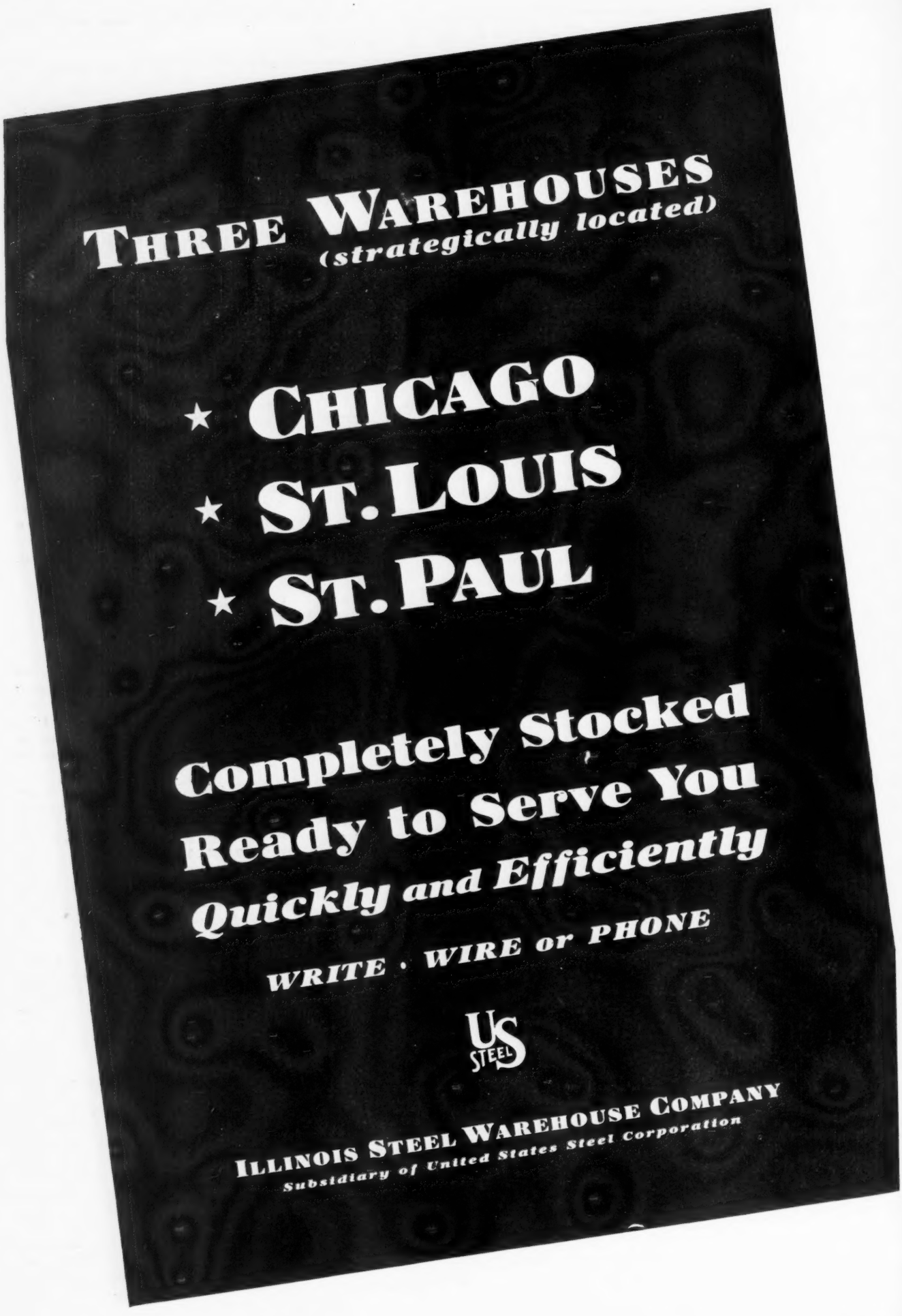
Sales to wholesalers make up 60 per cent of sales by manufacturing plants engaged primarily in the manufacture of tools other than edge on machine tools, files or saws in 1929, according to compilations by the bureau of the census.

Total sales by 533 concerns were $100,038,000, and 60.4 per cent or $60,377,000 were made in this way. These manufacturers sold 6 per cent or $6,045,000 worth goods to their own wholesale branches for resale to dealers or consumers. Remaining sales were 26.4 per cent to consumers direct and 7.2 per cent to retailers.

Specific products of this industry include stone and marblecutting tools, spirit levels, picks, plumbers and jewelers tools, shovels, spades hammers, and other tools.

Canada Reduces Imports

Production of galvanized sheets in Canada in the first six months of 1931 totalled 24,967 net tons. Imports of galvanized flat sheets during the same period were 9369 tons, of which 4938 tons came from Great Britain, 4342 tons from the United States, and 89 tons from other countries. Imports during the first half of 1930 totalled 19,044 tons. Five Canadian firms make galvanized sheets.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Wire

Jobbers Specify on Cheaper Third Quarter Tonnage—Prices Steady in Absence of Test

WIRE PRICES, PAGE 67

Chicago—While a few regular wire products buyers here have closed on fourth quarter contracts, forward interest has not improved materially. A number of jobbers are endeavoring to clean up obligations on third quarter merchant products contracts. Farm fencing sales are disappointing. Contract prices for merchant wire products are fairly steady, while 2.25c, Chicago or western mills, for manufacturers' wire, is untested.

Worcester, Mass.—Demand for and production of wire show no change. It is too early to predict results from the wage cut by the United States Steel Corp. although the general opinion is that savings may be passed along to the consumer.

New York—Nailmakers are bending their efforts to get all $1.80 tonnage off their books by Oct. 1, so as to further strengthen the $1.90, Pittsburgh, price, which is now being quoted on such light new business as is being offered. Wire is steady at 2.20c, Pittsburgh.

Philadelphia—Nail manufacturers are holding quotations firmly at $1.90, Pittsburgh. Wire is quiet at 2.20c, Pittsburgh.

Pittsburgh — Wire specifications have been stimulated by the $2 a ton advance instituted on jobbing products for fourth quarter and jobbers are adding moderately to their stocks in specifying against the lower-priced third quarter contracts. September business consequently will show a moderate gain over that of August although wire and wire rods are moving in practically unchanged volume. Some fourth quarter contracting is being done at the advanced market of $1.90 to jobbers on wire nails, although it is expected that heavier specifications recently will postpone additional buying in October. Plain wire continues 2.20c in the new quarter with wire rods, $35.

Cleveland — Featured by firmer price schedules for wire products, the market still displays listlessness insofar as customers' moves toward ordering material are concerned. Many third-quarter contracts are still held on mill books awaiting release and give promise of being in that state for some time. Fourth-quarter contracting is slow in proceeding. Nails are $1.90 a keg and plain wire is 2.20c, being well maintained by the several interests. Rods are $35 a ton.

Bolt, Nut, Rivet Buying Is in Fair Volume

Bolts, Nuts, Rivets Prices, Page 67

Pittsburgh—Fourth quarter contracts for bolts, nuts and rivets are in fair volume at 73 and 10 off for bolts and nuts and 2.50c, Pittsburgh, for large rivets. The market is fairly steady although occasional shading still is noted on bolts and nuts. Specifications are little changed and generally quiet, with little improvement noted over the August volume.

Philadelphia—Bolt and nut makers report increased buying, made up of small orders. The usual price is 73 and 10 off.

Cleveland—Fourth-quarter contracting has been encouragingly prompt in the action of customers' disposition to close this week on their anticipated needs for that period. Specifications likewise brought some optimism early in the week, though the entire month of September lagged behind August in volume, due largely to recessions in automotive specifications. Bolts and nuts are 73 and 10 off list; structural rivets continue 2.50c, Cleveland.

Chicago—Continued weakness in the 73 and 10 per cent discount for bolts and nuts has tended to slow down fourth quarter contracting. Contract business is not being pressed so much as usual. Specifications for bolts, nuts and rivets even were lower than August. Small rivets continue relatively firm at 70, 10 and 5 off.

Naval Aircraft Bids In

New York—Upson-Walton Co., Cleveland, is low on 5000 feet of phosphor bronze cable for San Diego, navy department, aero section, with a bid of 10.9c. Pacific Wire Rope Co., Los Angeles, with a bid of 25.28c is low on 13,104 feet of steel wire rope for Mare Island.

Hamilton Standard Propeller Co., Homestead, Pa., is low on 32 metal aircraft propeller blades at $3060 and 75 metal aircraft propeller hubs for San Diego at $5625. Steel Products Engineering Co., Springfield, O., bid $11,287.50 on 175 metal aircraft propeller hubs for Philadelphia and Hampton Roads and is low.

Fear Currency Collapse Will Swell British Orders

New York—Changes the past week in underlying factors affecting the nonferrous and ferrous metal markets have been the most portentious in a long time. Some authorities freely state that they are of greater significance than any previous developments since the outbreak of the World war in 1914. Collapse of the gold standard in London already has had serious repercussions in the financial and commodity markets of the world.

Leaders in the sensitive noferrous metal markets here are deeply concerned over the future, both near and distant. It has been a long time since the metal trade has been so bewildered.

Not only are the nonferrous metals affected, but all other commodity markets. When the German inflation developed after the war, an impressive feature was the extent to which German industries were flooded with orders from other countries. The same phenomenon has been witnessed since during the periods of inflation in France and Russia and other countries whose money at one time or another became depreciated.

Among recent cables was the telling of a sudden influx of foreign orders to the English cotton goods industry, and this no doubt is one of the immediate results of the inflation of British currency. If the inflation continues at the present rate, it is likely that English mills will soon be humming on all kinds of products for the world's markets, and one result would be that American industries would be further affected adversely.

Will English steel and pig iron be imported into the United States? This is a queston which is being asked in some quarters. If the rate of exchange sags further, the present tariff barrier may prove insufficient, and the United States may see a recurrence of the conditions of some years ago when large quantities of Belgian, French and other European steel and pig iron were delivered all along our seacoast.

Marting Iron & Steel Co., Ironton, O., has been awarded an abatement of $92,255 for overassessment of 1917 income and profits taxes, by the bureau of internal revenue, Washington.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, No. 2

Chicago furnace	$17.50
Pittsburgh, dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Valley furnace	17.00
Cleveland fur., local del.	17.00
Philadelphia, delivered	16.76 to 17.26
Virginia furnace	17.50
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.00
Buff., all-rail, Boston	19.91 to 20.41
Buff., all-rail, Brooklyn	19.90 to 20.40
Buff., all-rail, Newark	18.28 to 18.78
Ala., Bir. fur., local del.	12.00
Alabama, del. Chicago	17.01
Alabama, del. St. Louis	15.42
Alabama, del. Cincinnati	14.69 to 15.19
Ala., Phila., dock del.	16.00 to 16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.50
Ala., Boston dock del.	16.50 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	14.69 to 15.19
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	17.50
Buff., all-rail, Brooklyn	20.90 to 21.40
Buffalo, all-rail Newark	18.78 to 19.28
Buff., all-rail, Boston	20.91 to 21.41
Virginia furnace	18.00
Eastern, del. Phila	17.26 to 17.76

FOUNDRY, NO. 1X

Buffalo fur., local del.	18.50
Eastern, del. Phila.	17.76 to 18.26

MALLEABLE

Valley furnace	17.00
Cleveland fur., local del.	17.00
Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	17.50
Eastern Penna., delivered	18.26 to 20.41
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	16.00 to 16.50
Pittsburgh, delivered	16.63 to 17.63
Eastern Penn., del.	16.50
Buffalo fur., local del.	16.50 to 17.00
Montreal, delivered	20.50
Valley, furnace	17.00

BESSEMER

Valley furnace	17.00
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	16.50
Pittsburgh district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13

CHARCOAL

Lake Superior, del. Chi.	25.04

SILVERY

Jackson County, O., fur. in per cents: 6—$20; 7—$20.50; 8—$21; 9—$21.50; 10—$22; 11—$23; 12—$24; 13—$26.

BESSEMER FERROSILICON

Jackson County, O., fur. in per cents: 10—23; 11—$24; 12—$25; 13—$27; 14—$29; 15—$31; 16—$33.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.40 to 2.50
Connellsville foundry	3.25 to 4.50
New River foundry	6.90
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.70 to 9.10
Chicago, ovens	7.50
New England, del.	10.50
St. Louis, del.	8.50
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.00
Philadelphia, del.	8.75

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	8.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	8.50 to 9.00
Newfoundland fdy., 55%	8.50
Tungsten, spot and future short ton unit, duty paid	$11.25 to $11.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52%	24 to 26 cents
South African, 49-51%	23 to 24 cents
South African, 44-47%	22.50 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$40.00
Missouri	37.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 35.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	40.00
Joliet, Ill., East Chicago, Ind.	49.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Balt. base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$29.00
Pittsburgh, bessemer	29.00
Youngstown	29.00
Cleveland	29.00
Philadelphia	34.30
Chicago	30.00
Forging, Chicago	35.00 to 36.00
Forging, Pittsburgh	35.00
Forging, Philadelphia	39.30

SHEET BARS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00
Chicago	30.00

SLABS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con. del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.00 to 1.10
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	150.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50
Ferromolybdenum, stand. 50-60 per cent, per lb.	$1.00
Cal. Molybdate, lb. cont.	.85

†Carloads. Differentials apply to quant.
*To users of carloads to 500 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$13.00
Washed gravel, import duty paid east, tide, gross ton	18.50

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TESTED
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Superiority Proved by Service

Of equal importance to skill is the quality of Welding Wire. Good wire means perfect work, satisfied customers and lower shop costs. Premier Welding Wire is good wire—proved superior under all conditions of service—both electric and gas. Each bundle is shop tested to assure its uniform structure, free flowing and deeply penetrating qualities. Today, write us about your welding problems—no obligation.

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Export Distributors: United States Steel Products Company, New York

Pig Iron

Contracting for Fourth Quarter Slow—Shipments Fair—Competition Now Keener

PIG IRON PRICES, PAGE 78

Pittsburgh — The outlook in the pig iron market remains dull, with no improvement in orders or inquiries. Shipments continue at about the same volume as in the past several weeks, only slightly ahead of the low August rate. Operations at some radiator foundries show a seasonal improvement, requiring heavier shipments, but jobbing foundries are doing poorly. Prices are nominally unchanged, but unsettled somewhat by competition from outside districts.

New York—Pig iron sales here in the past week amounted to approximately 2500 tons, compared with 4000 tons in the preceding week. Inquiry is light, and prices are steady.

There has been little to test prices of foreign low phosphorus iron since the suspension of the gold standard by England. While reports from abroad indicate that steel prices are advancing, some observers look for the value of foreign pig iron to become increasingly attractive to buyers here, at least for a while. Domestic stocks of low phosphorus are known to be substantial, and unless sterling drops too fast and too low, stocks in this country may be expected to supply the bulk of needs, except where foreign iron is required for special mixtures. Foreign ore prices appear to have steadied, with the increase in shipping rates offsetting the drop in sterling. It is pointed out, however, that with rates representing more than half the cost of the c.i.f. price of ore, the rates are much more of a stabilizing factor than they are in the case of pig iron, where the element of labor enters more into costs.

Philadelphia—The market for pig iron is exceedingly quiet. Pending a test on substantial tonnage, eastern Pennsylvania iron is unchanged at $16 to $16.50, base, furnace. Southern iron is $11, base, furnace.

Buffalo—Pig iron continues to move sluggishly. While one or two producers here claim to have fixed a minimum base of $16 on iron for eastern shipment, others say $15.50, or even $15, must be quoted to compete.

Youngstown, O. — Purchases continue small. While some northern Ohio producers have offered pig iron at prices equivalent to $16, furnace, and lower, valley producers are obtaining $17, furnace, for these grades. Shipments are maintained at August and July levels.

Cleveland—Pig iron producers do not anticipate any further reduction in prices as a result of lower costs following the cut in common labor rates. They estimate the general saving as 5 to 6 cents a ton of pig iron. The labor item is one of the least important. The price for local delivery is firm at $17, base, furnace, but as business here is lacking makers have had to compete in outside districts, and less than $16, base, has applied. September shipments were slightly larger than those of August, but the movement was slower in the latter part of the month, as demand from the automotive industry did not hold up as expected. Sales by furnace interests with headquarters in Cleveland in the past week totaled approximately 5000 tons.

Cincinnati—Shipments of pig iron against old contracts continue to show improvement, but new business is light, with no indication of interest in fourth quarter needs. Southern iron remains firm at $11, base, Birmingham. An inquiry for 500 tons of northern iron is pending.

Chicago—Despite vigorous sales efforts, merchant pig iron orders make little gain, although September sales were ahead of August and shipments were nearly 15 per cent better. Both spot and forward sales are being closed at $17.50, base, Chicago, furnace. An inquiry for 500 to 1000 tons of southern iron for an Indiana stove company remains open.

St. Louis—A moderate improvement is noted in the pig iron market. The number of small sales is increasing, amounting to 1800 tons in the past week. Shipping specifications are more satisfactory. Stove foundries are operating on higher schedules; malleable plants making automotive castings also are busier. Prices are firm.

Birmingham, Ala.—Pig iron production in this district continues at about 60 per cent. Sales are small, but frequent.

Toronto, Ont.—Demand for merchant pig iron in the Canadian markets is slow, sales for the week amounting to about 500 tons. Pipe foundries are the principal buyers. Basic is practically at a standstill. Prices are unchanged.

Ferroalloy Orders Small; Shipments at Quiet Rate

Ferroalloy Prices, Page 78

Pittsburgh — Shipments of ferroalloys show little change from the quiet rate of the past several weeks. The September volume approximated that of August, although some seasonal improvement had been anticipated. Few orders are appearing in the spot market. Ferromanganese continues $89.79, delivered, with spiegeleisen $30, furnace.

New York—Despite light specifications, ferromanganese is unchanged at $85, duty paid, in car lots. While sellers look for an increase in specifications in October, there has been little seasonal improvement to date. This also applies to spiegeleisen. Domestic spiegeleisen, 19 to 21 per cent, is $30, furnace, in car lots.

Forging Billet Business Shows Some Improvement

Semifinished Prices, Page 78

Pittsburgh—The dull outlook for finished steel demand continues to restrict orders for semifinished steel. Shipments generally lack improvement over the August volume. Requirements of sheet, strip and bar mills remain quiet but forging billets are slightly more active than a month ago. On new business $29 usually is quoted for rerolling billets, slabs and sheet bars. Forging billets and wire rods continue $35.

Youngstown, O.—Activity continues confined to small lots of billets and sheet bars, with a sprinkling of slabs. Absolutely necessary requirements of consumers form the basis of current specifications. Billets, sheet bars and slabs bring $29, Pittsburgh and Youngstown.

Asks Fan and Motor Bids

Boston Transit department, Boston, takes bids Oct. 14 on ventilating fans and motors for installation in the Boston and East Boston buildings of the traffic tunnel. Equipment will include 28 large fans and driving motors. Ernest R. Springer is chief engineer.

George Stant Machine Works, Connersville, Ind., has changed its name to Stant Mfg. Co.

Scrap

Eastern Weakness Causes Drop at Chicago — Easy Situation Brings Slight Decline

Chicago—Weakness has developed in heavy melting steel, reflecting the easier tone in eastern scrap markets, a revival of short activity, and further direct sales on the part of small yard interests desiring to liquidate. About 2000 tons originally was sold at $8.25, or 25 cents under the recent market, and this sale was followed by orders for 3000 tons more. These sales closely followed an order at the recent price of $8.50, but most dealers now have adopted the lower range. Recent reports that heavy melting steel is to be shipped eastward by boat from this district have not been substantiated, but cast borings are being collected at docks for probable lake shipment. About 45 days remain for shipping by water. Sentiment is improved, despite

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to 8.50
Boston, dealers	4.10 to 4.60
Buffalo, No. 1	9.00 to 9.50
Buffalo, No. 2	7.75 to 8.25
Chicago	7.75 to 8.25
Cinci., deal.	7.25 to 7.75
Cleve., No. 1	8.50 to 9.00
Cleve., No. 2	7.50 to 8.00
Det., No. 1 deal.	6.50 to 7.00
Det., No. 2 deal.	5.00 to 5.50
E. Pa. del. mill	8.00 to 9.00
N. Y. deal. R. R.	5.00 to 6.50
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	4.00 to 4.50
Pitts., No. 1	10.50 to 11.00
St. L. No. 1 sel.	8.00 to 8.20
Federal, Ill.	7.50 to 8.00
Granite City, Ill.	7.00 to 7.50
Valleys, No. 1	10.25 to 10.75

COMPRESSED SHEETS

Buffalo, dealers	7.75 to 8.25
Chi., (Factory)	7.00 to 7.50
Cleveland	7.50 to 7.75
Detroit, dealers	6.50 to 7.00
E. Pa. new mat.	8.00 to 9.00
Pittsburgh	10.25 to 10.75
Valleys	9.50 to 10.00

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cinci., deal.	6.75 to 7.25
Cleveland	6.50 to 7.00
Eastern Pa.	6.50 to 7.00
Pittsburgh	9.75 to 10.25
St. Louis	5.00 to 5.50

SHEET CLIPPINGS LOOSE

Chicago	4.00 to 4.50
Cincinnati	4.00 to 4.50
Detroit, dealers	3.50 to 4.00
St. Louis	5.00 to 5.50

STEEL RAILS SHORT

Birmingham	10.75 to 11.50
Boston, dealers	3.10 to 4.60
Buffalo	12.00 to 12.50
Chicago (3 ft.)	10.00 to 10.50
Chicago (2 ft.)	10.75 to 11.25
Cinci., deal.	12.50 to 13.00
Detroit, deal.	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	12.50 to 13.00
St. Louis	12.00 to 12.50

STOVE PLATE

Birmingham	6.50 to 7.00
Boston, con.	5.00 to 5.50
Buffalo	8.25 to 8.50
Chicago, net	7.00 to 7.50
Cinci., deal. net	4.50 to 5.00
Det., net deal.	4.00 to 4.50
Eastern Pa.	7.50 to 8.00
N. Y., deal. mill	4.75 to 5.50
St. Louis	6.50 to 7.00

COUPLERS, SPRINGS

Buffalo	11.00 to 11.50
Chicago	9.25 to 9.75
Eastern Pa.	13.00
Pittsburgh	12.00 to 12.50
St. Louis	8.50 to 9.00

ANGLE BARS—STEEL

Chicago	9.25 to 9.75
St. Louis	7.50 to 8.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.75 to 13.25
Cleveland bil. and bloom crops	12.00 to 12.50
Eastern Pa.	13.50 to 14.00
Pittsburgh billet bloom crops	14.00 to 14.50
Pitts. sheet bar crops	13.00 to 13.50

FROGS, SWITCHES

Chicago	8.50 to 9.00
St. Louis	8.50 to 9.00

SHOVELING STEEL

Chicago	7.75 to 8.25
Cleveland	6.50 to 7.00
St. Louis	7.50 to 8.00

RAILROAD WROUGHT

Birmingham	7.50 to 8.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	7.00 to 7.50
Buffalo, No. 2	9.00 to 9.50
Chicago, No. 1	8.00 to 8.40
Chicago, No. 2	7.75 to 8.25
Cinci., No. 2	7.25 to 7.75
Eastern Pa.	9.50 to 10.00
N. Y., No. 1, deal.	9.00 to 9.50
Pitts., No. 2	10.50 to 11.00
St. Louis, No. 1	5.00 to 5.50
St. Louis, No. 2	7.50 to 8.00

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	9.50 to 10.00
N. Y., deal.	5.00 to 5.50

BUSHELING

Buffalo, No. 1	7.75 to 8.25
Chicago, No. 1	6.75 to 7.25
Cinn., No. 1 dl.	6.00 to 6.50
Cinn., No. 2	3.50 to 4.00
Cleve., No. 2	6.25 to 6.75
Det., No. 1 new deal.	5.25 to 5.75
St. L., No. 1	6.00 to 6.50
Val. new No. 1	9.25 to 9.75

MACHINE TURNINGS

Birmingham	3.50 to 4.00
Boston, dealers	1.75 to 2.00
Buffalo	4.75 to 5.25
Chicago	4.25 to 4.75
Cinn., deal.	3.75 to 4.25
Cleveland	5.00 to 5.50
Detroit	3.75 to 4.25
Eastern Pa.	5.00 to 5.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.50 to 8.00
St. Louis	3.00 to 3.50
Valleys	7.75 to 8.25

BORINGS AND TURNINGS
For Blast Furnace Use

Boston	1.50 to 1.75
Buffalo	6.00 to 6.50
Cinn., deal.	4.50 to 5.00
Cleveland	6.50 to 7.00
Detroit, deal.	4.75 to 5.25
Eastern Pa.	5.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.50 to 4.00
Boston, chem.	7.00 to 7.25
Boston, deal.	1.50 to 1.75
Buffalo	6.00 to 6.50
Chicago	4.00 to 4.50
Cinn., deal.	3.75 to 4.25
Cleveland	6.50 to 7.00
Detroit, deal.	4.75 to 5.25
Eastern Pa.	5.00 to 6.00
E. Pa., chem.	10.50 to 12.00
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.50 to 8.00
St. Louis	5.50 to 6.00

PIPE AND FLUES

Cinn., deal.	6.00 to 6.50

RAILROAD GRATE BARS

Buffalo	6.50 to 7.00
Chicago, net	5.75 to 6.25
Cincinnati	5.50 to 6.00
Eastern Pa.	7.50 to 8.00
N. Y., deal.	5.00 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, deal.	5.00 to 5.25
Buffalo	7.50 to 8.00
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	5.50 to 6.00

FORGE SCRAP

Boston, del.	2.00 to 2.25
Chicago	11.00 to 11.50
Eastern Pa., del.	8.00 to 8.50

ARCH BARS, TRANSOMS

Chicago, net	9.00 to 9.50
St. Louis	7.75 to 8.25

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	7.50 to 8.00
Chi., steelworks	7.00 to 7.50
Cleveland	6.75 to 7.00
Eastern Pa., del.	7.50 to 8.50
Pittsburgh	9.50 to 10.00
St. Louis	6.50 to 7.00

STEEL CAR AXLES

Birmingham	11.50 to 12.00
Boston, ship. pt.	11.00 to 12.00
Buffalo	14.50 to 15.00
Chicago	12.90 to 13.45
Eastern Pa.	17.00 to 18.00
St. Louis	11.50 to 12.00

SHAFTING

Bos., ship. pt.	10.00 to 10.50
Chicago	8.95 to 9.50
N. Y., deal.	9.00 to 9.50
St. Louis	9.00 to 9.50
E. Penna.	16.00

CAR WHEELS

Birming., iron	8.50 to 9.50
Boston, iron	14.00 to 14.50
Buffalo, iron	10.50 to 11.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi. rolled steel	9.50 to 10.00
Cincinnati, iron	9.50 to 10.00
E. Pa. steel	10.50 to 11.00
E. Pa. iron	12.50 to 13.00
Pitts. iron	11.00 to 11.50
Pitts., steel	12.00 to 12.50
St. Louis, iron	7.00 to 7.50
St. Louis, steel	8.50 to 9.00

NO. 1 CAST SCRAP

Birmingham	8.50 to 9.00
Buffalo (mach.)	10.25 to 10.75
Boston, textile	10.00 to 10.50
Chicago, mach.	9.80 to 10.35
Chi., railroad	8.70 to 9.25
Chicago, agri.	8.40 to 8.95
Cinn., mach. cup., gross	12.25 to 12.75
Cleve. cupola	10.00 to 10.50
Det., net deal.	8.00 to 8.50
E. Pa., cupola	12.50 to 13.00
N. Y. cup. deal.	7.00 to 7.50
N. Y., del. local foundries	12.00
Pitts., cupola	10.00 to 10.50
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	8.50 to 9.00
St. L. No. 1	7.50 to 8.00

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast.	11.50 to 12.50
Buffalo, break	6.75 to 7.25
Cleve., break	6.00 to 6.50
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	5.50 to 6.00
Eastern Pa.	9.50 to 10.00
N. Y. No. 1 dl.	7.00 to 7.50
N. Y., break, dl.	6.50 to 7.00
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	10.00 to 10.50
Chicago, agri.	8.00 to 8.50
Chicago, R. R.	8.50 to 9.00
Cinci., R. R. del.	10.25 to 10.75
Cinci., agri. del.	10.00 to 10.50
Cleveland, rail	10.00 to 10.50
Det. auto deal.	9.50 to 10.00
St. Louis, rail	6.75 to 7.25

RAILS FOR ROLLING
5 feet and over

Birmingham	10.50 to 11.00
Boston	7.50 to 8.00
Buffalo	10.00 to 10.50
Chicago	10.50 to 11.00
Eastern Pa.	11.50 to 12.00
New York	6.25 to 6.75
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago, cut	11.00 to 11.50
St. L., No. 1	9.00 to 9.50

LOW PHOS. PUNCHINGS

Chicago	11.00 to 11.50
Buffalo	12.50 to 13.00
Eastern Pa.	13.00 to 14.00
Pittsburgh	13.50 to 14.00

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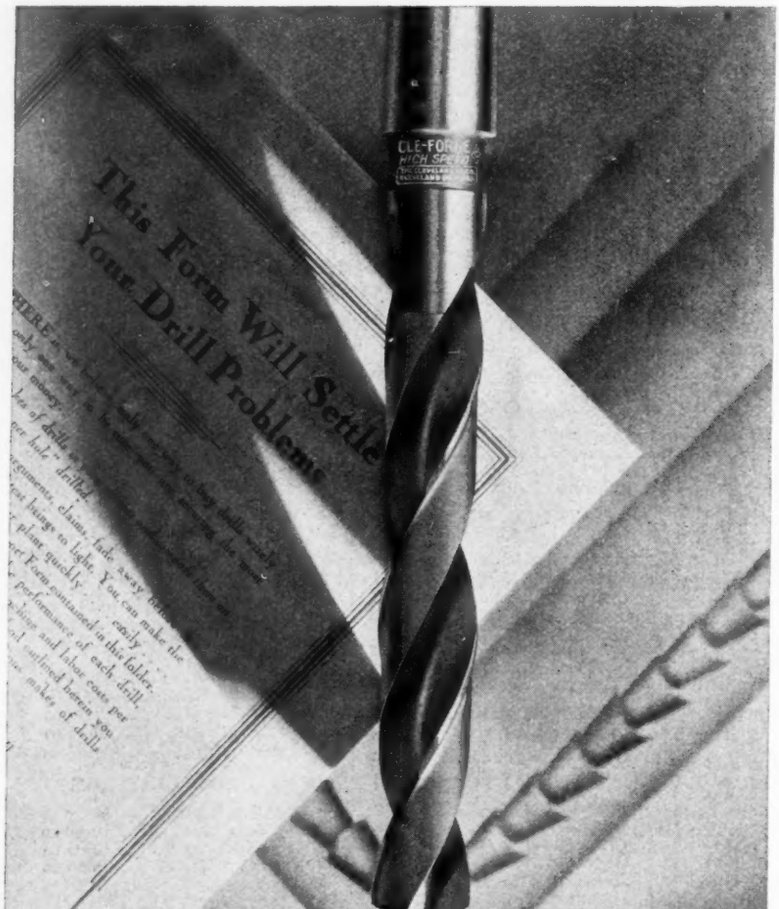

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the weakness in melting steel, and is due in part to the reports of better business in the East.

Philadelphia—Steel and iron scrap is dull and easier, with nominal revisions in several grades. A Pencoyd, Pa., consumer has closed for a tonnage of heavy breakable cast at $9.50, delivered.

Buffalo—Estimates, believed reliable, place the total of Bethlehem's new purchases of scrap for Lackawanna delivery at 4000 to 5000 tons, of which slightly less than half was bought direct from railroads at $9.50 and the rest from local dealers at $9, according to these reports. Otherwise the market is without change or feature. First reports indicated a much larger purchase than that indicated.

Pittsburgh—Tone of the market for steel and iron scrap is weakened slightly by lack of buying by steel mills but this is offset partly by lack of heavy offerings. Railroad lists are light, the Pennsylvania railroad listing only 17,000 tons and the Baltimore & Ohio railroad only 3000. Heavy melting steel is unchanged at $10.50 to $11, following recent sales at $10.75. Compressed sheets are nominally easier, while borings and turnings are slightly stronger on a sale at $8.

Cleveland—With both local mills and those in the Youngstown district continuing to hold up shipments of all grades of iron and steel scrap, conditions in the old materials markets here still are puzzling. No change is apparent in quotations, either. An interesting scrap trade feature developed last Saturday at Fairport, O., just east of Cleveland on Lake Erie. A former ore-carrying vessel now equipped with two electric magnets for handling scrap was unloading a cargo of heavy steel and pressed sheets. The cargo was consigned from Detroit and via the Baltimore & Ohio railroad, was being sent forward to an important independent steelmaker in the Youngstown district. This is not an isolated shipment but is one of several similar that have been made during the present season of navigation.

Cincinnati — Small transactions and light shipments continue in iron and steel scrap. Sales recently have provided no test of prices, which are nominally unchanged. Some important consumers still restrict shipments.

Detroit—Absence of trading has left the steel and iron scrap market unchanged. As the close of navigation approaches inquiries for shipment by boat have increased, but this has not improved the general situation.

St. Louis—While buying of iron and steel scrap by melters is in small volume, sentiment has improved and the belief prevails among both buyers and sellers that the trough of the depression has been passed. Several of the larger consumers for the first time in many weeks have evinced a willingness to buy, but they are seeking bargains and offers are too far under the market to result in sales.

Birmingham, Ala.—Buying of steel and iron scrap is in scattered small lots. Prices are low and concessions are made.

Toronto, Ont.—Dullness continues in the iron and steel scrap market. Consumers show little interest and purchases are for spot delivery. Mills are out of the market for heavy melting steel and turnings. Iron scrap has an irregular call, with machinery cast in first position. Dealers are still out of the market and prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Army Buys Plates, Rivets

New York—Army engineer corps has placed 15,000 pounds of buttonhead rivets for Huntington, W. Va., with Neely Nut & Bolt Co., Pittsburgh, on a bid of $2.80. Central Iron & Steel Co., Harrisburg, Pa., booked 7267 pounds of steel plates for Huntington. Reichman-Crosby Co., Memphis, Tenn., booked a wire rope contract from the engineer at that point on a bid of $1560.70. Janney, Sample, Hill & Co., Minneapolis, took 1000 feet of ¾-inch wire rope for St. Paul on a bid of $16.75 per 100 feet. Boss Bolt & Nut Co., Chicago, booked 24,500 machine and carriage bolts for Vicksburg, Miss.

Coke

Moderate Seasonal Gains Reported—Beehive Output Slightly Larger—Prices Steady

COKE PRICES, PAGE 78

Pittsburgh—Beehive coke activity is slow to improve. Some seasonal gain is noted in demand for heating fuel and furnace coke for gas producers, but blast furnace and foundry requirements still are light. A contract for 700 tons of furnace coke daily for a steelworks stack going in blast went to a local by-product interest. W. J. Rainey Inc. has fired 120 additional ovens at Allistone, raising its active units to 315.

Cincinnati—Demand for by-product foundry coke is moderately better, with an increase in the melt in some parts of this district.

New York—Coke demand continues spotty, notwithstanding a slight improvement in the foundry melt in this district. Beehive furnace coke continues $2 to $2.25, Connellsville, Pa., and beehive foundry, $3 to $3.25, Connellsville, for the ordinary grades and $4.50, Latrobe, Pa., for premium brands. By-product coke is $8.70 to $9.10, Newark N. J., $10.50, New England; and $8.75, Philadelphia. Improved inquiry for by-product coke for domestic consumption is expected shortly.

St. Louis—Shipments for September are likely to prove smaller than those for August. Producers report fair specifications from western and southwestern consumers for October, with a few orders. Generally, however, little attention is being paid to full fourth quarter requirements.

Birmingham, Ala.—Demand for coke has shown no improvement, weather conditions, as well as general business, being adverse. Foundry fuel is being purchased in small lots.

The Ohio chamber of commerce will hold its annual meeting at the Deshler-Wallick hotel, Columbus, O., Nov. 6-7. George B. Chandler, Huntington Bank building, Columbus, is secretary of the organization.

Pacific Coast

Increased Inquiry Gives Better Aspect to Market—Hangar Tonnage Bids Are in—Prices Are Steady—Large Metal Shipment Goes to Holland—Public Works Continue Largest Factor

Seattle—Awards of iron and steel in the Pacific Northwest during the week approximated 2500 tons. While no large projects are pending there is sufficient business up for figures to give the general situation a more hopeful aspect. Mill prices are holding steady at low levels, plates generally quoted at 1.90c, merchant bars and shapes at 2.00c to 2.05c and reinforcing bars at 2.30c.

The largest bar metal shipment ever loaded from any British Columbia port went from New Westminister, B. C., last week on the norwegian motorship HARDANGER bound for Antwerp and Rotterdam. These shipments average from 1000 to 1200 tons each but the HARDANGER took out 2481 long tons for the Consolidated Mining & Smelting Co.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Local mills are supplying small tonnages of reinforcing materials from stock, no large projects being immediately at hand. Awards this week totaled about 450 tons. For the South Hill sewer project, Vancouver, B. C., awarded 227 tons to the Dominion Bridge Co. and more than 100 tons to Evans, Coleman & Evans, ¾-inch square, at $2.94 per cwt., ⅜-inch round at $3.32, ½-inch square at $3.12. Pacific Coast Steel Co., Seattle, booked 135 tons for a reservoir for Wenatchee, Wash. General contracts for approaches to the Aurora street bridge, Seattle, have been awarded by both state and city, these jobs calling for about 250 tons of reinforcing. Helena, Mont., will open bids Sept. 28 for a water reservoir involving 125 tons of reinforcing and 30 tons of shapes. King county, Wash., will receive tenders Oct. 13 for construction of a 220-foot reinforced concrete span.

Plate awards approximated 1000 tons, the largest, 600 tons, being taken by the Truscon Steel Co., Cleveland. This material is 3/16 and ¼-inch tunnel liner plate for the Cle Elum dam project, general contract held by Winston Bros., Minneapolis. Truscon Steel Co. is also supplying 23 large vertical steel lift doors for the Seattle assembly plant of Ford Motor Co. Steel Tank & Pipe Co., Portland, Oreg., has contracts for tanks and other work for terminals for the Liberty Petroleum Co., Linnton, Oreg., and Fletcher Oil Co., Vancouver, Wash., and 400 tons of plates.

Bids are expected to be called in November for the Portland federal building involving about 700 tons of shapes. Hofius Steel & Equipment Co., Seattle, was low bidder for furnishing about 100 tons of shapes for framing, craneway and crane for two shops for the McNeil island federal prison. About 240 tons of structurals for federal bridges in Oregon are about to be awarded, general contracts being under consideration.

Finished Materials

The wholesale jobbing business is slow and spotty. Buying is in small lots and almost exclusively from stocks. Efforts are being made to stabilize prices.

The largest steel award of the week, 500 tons of 82-pound 7-inch plain, open-hearth steel girder rails for the Seattle street railway went to Pacific Coast Steel Corp., Seattle, at $58.65 per gross ton.

Pipe Demand Is Light

United States Pipe & Foundry Co., Seattle office, booked 350 tons of 4, 8 and 16-inch centrifugal pipe for the Ann Arbor avenue project, Seattle.

Navy Hangar Bids In

San Francisco—*(By Air Mail)*—Interest this week was centered in the opening of bids on the Sunnyvale, Calif., air dock for the navy department. The Wallace Bridge & Structural Steel Co., Seattle, was low bidder on the structural steel, 8000 tons.

Demand continues quiet and sales and inquiries were not numerous. While city, county and state projects continue to make most of the current inquiry new work of this nature is slow in coming out.

Bars, Plates and Shapes

Reinforcing bar awards this week totaled slightly over 800 tons, mostly small lots. Among the new inquiries are 1100 tons for a breakwater for Santa Monica, Calif., and 600 tons for a gymnasium for the University of California at Los Angeles. Prices in the Los Angeles district remain unchanged at 2.50c, base, on carload lots, while San Francisco prices are firm at 2.60c. Mild steel bars are moving in small lots only and 2.05c, c.i.f., is general.

No plate awards of size were reported placed during the week. Bids were opened on a 12,000-ton pipe line for Lincoln, Nebr., and the Lock-Joint Pipe Co. was low bidder on the basis of reinforced concrete pipe. Prices are 1.85c to 1.95c, c.i.f.

The Consolidated Steel Corp. booked 600 tons of structural shapes for a gymnasium for the University of California, Los Angeles, and the Judson-Pacific Co. took 500 tons for a sub-station in San Francisco for the Pacific Gas & Electric Co. Bids were opened on 128 tons for a bridge at Hanafer, Utah. Plain shapes continue to range between 2.05c and 2.15c, c.i.f.

Other Finished Material

The American Cast Iron Pipe Co. secured 347 tons of 4 to 10-inch pipe for Fresno, Calif., and was low bidder on 139 tons of 4 to 8-inch pipe for Anaheim, Calif. Bids will be opened Oct. 5 by the East Bay municipal utility district, Oakland, Calif., for 1644 tons of 4 to 8-inch pipe. Plans are now being prepared for three improvement projects in Salt Lake City, Utah, which will require over 1000 tons of 2 to 16-inch pipe. Little of importance has come up in the market for standard steel pipe of late. No large pipe line inquiries are current.

Fulton Iron Works Is A Voluntary Bankrupt

Fulton Iron Works, St. Louis, has filed a petition in voluntary bankruptcy in federal court for the purpose of offering a composition to creditors. The company has been in business for 80 years and has specialized largely in sugar machinery and engines. E. W. Kopke, president, stated in the petition that the company is not insolvent but could not meet maturing obligations and was threatened with suits by creditors.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	58	44½	½	23	5
¼	62	50½	¾	28	11
1—3	64	52½	1—1¼	31	15
			1½—2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7—8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7—8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f. o. b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$33.00 to 35.00
Four-inch, Birmingham .... 37.00 to 39.00
Four-inch, Chicago ..... 43.00 to 46.00
Six to 24-inch, Chicago..... 40.00 to 43.00
Six-inch and over, N. Y..... 28.50 to 30.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.00c
Chattanooga..	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia..	2.60c
Pittsburgh	2.60c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia..	2.60c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga..	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.60c
San Fran. cl.	2.30c
San Fran. lcl.	2.50c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.35c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia..	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles..	3.40c
New York(d)	3.30c
Philadelphia..	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.915c
Buffalo	3.50c
Chattanooga..	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.00c-3.40c
Portland	4.00c
Phila.*† (e)..	3.05c
Pitts.**	2.60c to 2.85c
San Fran.	3.65c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	3.70c
Chattanooga..	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.60c
Detroit	3.50c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†(e)	3.55c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.15c
Seattle	4.25c
St. Louis	3.80c
St. Paul	3.545c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo	4.10c
Chattanooga..	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	4.00c
Detroit	4.00c
Houston	5.40c
Los. Ang.	5.10c
New York	4.00c-4.10c
Phila.*† (e)	4.00c
Pitts.**	4.00c
Portland	5.00c
San Fran.	4.65c
Seattle	4.75c
St. Louis	4.35c
St. Paul	4.23c
Tulsa	5.10c

BANDS

Baltimore	3.50c
Boston	3.75c-4.25c
Buffalo	3.35c
Chattanooga..	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia..	2.90c
Pittsburgh	2.95c
Portland	3.50c
San Fran.	3.75c
Seattle	3.50c
St. Paul	3.75c
Tulsa	3.45c

HOOPS

Baltimore	3.50c
Boston	4.90c-5.40c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia..	3.15c
Pittsburgh	3.60c
Seattle	4.90c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.75c
Chicago	3.10c
Cincinnati	3.50c
Cleveland	3.10c
Detroit	3.40c
Los Ang. (a)	4.50c
New York	3.40c
Philadelphia*	3.40c
Pittsburgh	3.10c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.85c
St. Louis	3.35c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	5.65c
Cincinnati	5.80c
Clev. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.

When You Purchase Refractories

From a satisfied customer:—

Gentlemen:—

We enclose herewith our order No. 201 for a mixed car load of fire brick. The brick you furnished this company on our order No. 5141 were far superior to anything we have ever used, and we wish you would furnish the same quality on the enclosed order.

Does it mean anything to YOU if the manufacturer owns vast acreages of high grade ganister and clays of un-equalled quality, and that back of the product is 75 years of experience?

It Should

When you buy from HAWS you receive the benefit of both without additional cost.

Mail us a trial order and we can satisfy YOU too.

HAWS REFRACTORIES CO.

SILICA and FIRE CLAY-BRICK SPECIALISTS

JOHNSTOWN, PA.

LARGEST BUILDERS OF THE WORLD'S LARGEST CRANES

Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

Ladle Cranes
Ingot Strippers
Soaking Pit Cranes
Open Hearth Charging Machines
Slab and Billet Charging and Drawing Machines
Gantry Cranes
Ore and Coal Bridges
Car Dumpers
Forging Manipulators
Steam Drop Forge Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

271 of 100 Tons Capacity and over

LADLE AND STANDARD CRANES

59		100 tons
2	WORM DRIVEN Ladle,	100 tons
2		115 tons
6	WORM DRIVEN Ladle,	125 tons
45		125 tons
30		150 tons
3	WORM DRIVEN Ladle,	150 tons
6	WORM DRIVEN Ladle,	160 tons
2	WORM DRIVEN Ladle,	165 tons
4	WORM DRIVEN Ladle,	175 tons
27		175 tons
3	WORM DRIVEN Ladle,	200 tons
4		200 tons
5		225 tons
1		250 tons
3	WORM DRIVEN Ladle,	250 tons
3	WORM DRIVEN Ladle,	275 tons
1		275 tons
1		300 tons
3		430 tons

STRIPPING CRANES

8		100 tons
1		125 tons
21		150 tons
19		200 tons
1	Single Ram,	320 tons

COMBINATION CHARGERS AND STRIPPERS

3		100 tons
1		125 tons
3		150 tons
4		200 tons

Give Us the Runway and We will Lift the World

THE ALLIANCE MACHINE CO.

ALLIANCE, OHIO, U.S.A.

ENGINEERS AND BUILDERS

Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 7.75c, Conn., for copper

Sheets	
Yellow brass (high)	15.00
Copper, hot rolled	17.12½
Lead, full sheets (cut ½c more)	8.25
Zinc sheet (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	19.75
Seamless copper	19.62½
Rods	
Yellow brass (high, full turnings)	13.25
Naval brass	14.37½
Anodes	
Copper, untrimmed	14.62½
Wire	
Yellow brass (high)	15.50

Old Metals

Dealers' buying prices, cents lb. No. 1 Composition Red Brass

New York	4.25 to 4.50
Chicago	4.00 to 4.50
Cleveland	4.50 to 4.75
St. Louis	4.00
Heavy Yellow Brass	
New York	2.75 to 3.00
Heavy Copper and Wire	
New York	5.25 to 5.50
Boston	4.75 to 5.00
Chicago	4.12½ to 4.37½
Cleveland	4.50 to 4.75
St. Louis	4.25 to 4.50
Composition Brass Borings	
New York	4.00 to 4.25
Yellow Brass Tubing	
Cleveland	2.75 to 3.00
Light Copper	
New York	4.25 to 4.50
Chicago	4.00 to 4.25
Cleveland	4.00 to 4.25
St. Louis	4.00
Light Brass	
Boston	2.50 to 2.75
Chicago	2.25 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.25
Zinc	
New York	1.25 to 1.50
Cleveland	1.25 to 1.50
St. Louis	1.50
Aluminum	
Clippings, soft, Cleveland	12.50 to 13.00
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	3.50 to 4.50
Mixed cast, Cleveland	4.00 to 4.50
Mixed cast, Boston	3.25 to 3.50
Mixed cast, St. Louis	4.00

Secondary Metals

Remelt aluminum No. 12	8.50 to 9.50
Brass ingots, 85-5-5-5	7.37½

Metals

Copper Holds Fairly Steady With Lead Firm—Zinc Easier —Tin Prices Are Weaker

New York—The metals held fairly steady during the past week in view of the unsettled conditions in world financial and commodity markets. Straits tin was the only metal to show outstanding weakness and this was attributed to the fact that it is readily influenced by activity in London. Trading in all metals has been somewhat restricted because of the sharp fluctuations in sterling exchange.

Copper held unchanged at 7.00c, Connecticut, and the situation showed a slight improvement. Resellers have withdrawn offerings made at a concession of ¼-cent under the going market. Lead held steady during the period with inquiry somewhat better. Zinc was easier with antimony quiet.

Copper—Demand from domestic consumers currently is light but exports are in fair volume. The official export price holds at 7.50c c.i.f. European ports or on the basis of 7.25c, Connecticut. Producers continue out of the market but are supplying affiliated fabricators with metal at 7.25c, Connecticut. The opinion is expressed in the trade that producers could book a considerable volume of business if the metal were offered at 7.00c. Copper imports in the first eight months of this year declined 42 per cent from a year ago, while exports fell only 12 per cent. Sharp increase in scrap shipments featured exports.

Tin—Straits metal has been easy during the past several days, largely reflecting weakness in the London market. Domestic purchasers are hesitant in making commitments due to current unsettled conditions. Little progress has been made in tin curtailment, countries participating in the restriction agreement producing 10,277 tons in August, against 9790 tons in July and 1436 tons over the quota for the month. Malay States, however, are expected to hold output at 40 per cent. London warehouse stocks declined 377 tons last week.

Lead—The market shows a firmer tendency, particularly on the announcement that the producers in Southeastern Missouri will immediately curtail output by 20 per cent. This is equivalent to a 9 per cent cut for the domestic industry. Demand from domestic consumers shows an improvement.

Zinc—Inquiries are light. Sales during the past week totaled no more than 1500 tons. The market is somewhat weaker with metal now being available at 3.65c, East St. Louis, the lowest quotation in a number of weeks. Tri-State concentrate stocks declined slightly last week but the total still is excessive.

Aluminum—No. 12 remelt is quoted lower at 8.50c to 9.50c, f.o.b. shipping points. Virgin metal remains unchanged. New business is light.

Antimony—Spot metal is quiet and available at 6.50c to 6.60c, duty paid. Few future offerings are being made due to unsettled conditions in China.

Canadian Pig Iron Drops; Ferroalloys and Ingots Gain

Toronto, Ont.—Output of pig iron in Canada in August was 22,212 tons, compared with 40,303 tons for July, the lowest monthly total since December, 1924, when 22,544 tons was produced. The decline from July was well distributed as to grades. Three furnaces were in blast, at Hamilton, Port Colborne and Sault Ste. Marie. Two furnaces were banked, one at Sault Ste. Marie and one at Sydney.

For eight months ending Aug. 31 cumulative production was 362,737 tons, compared with 573,321 tons for the corresponding period of 1930. Ferroalloy production for August was 8248 tons, the highest for any month to date, compared with 3262 tons in July.

Steel ingots and castings produced in August totaled 52,491 tons, compared with 45,097 tons in July, a gain of 16 per cent. This was 5135 tons less than production in August, 1930.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
September 23	7.00	7.37½	6.87½	23.50	23.75	4.40	4.22½	3.70	22.90	6.50	35.00
September 24	7.00	7.37½	6.87½	23.37½	24.00	4.40	4.22½	3.70	22.90	6.50	35.00
September 25	7.00	7.37½	6.87½	23.00	23.25	4.40	4.22½	3.70	22.90	6.55	35.00
September 26	7.00	7.37½	6.87½	23.00	23.25	4.40	4.22½	3.70	22.90	6.55	35.00
September 28	7.00	7.37½	6.87½	22.50	22.75	4.40	4.22½	3.70	22.90	6.50	35.00

Europe

Gold Suspension Strengthens and Enlivens British Markets—Continental Situation Uncertain

London—(*By Cable*)—Great Britain's suspension of the gold standard has restored a considerable measure of confidence in the iron and steel industry. The markets are more animated, and prices are tending upward, especially those of billets and sheet bars. Tin plate merchants have withdrawn all quotations.

A brighter tone has developed in Continental steel, and in the Midland pig iron markets. Buying is heavier than for many weeks, due to expected price advances. The Barrow Hematite Co. is relighting two blast furnaces.

British iron and steel imports in August amounted to 201,920 tons, 29,097 tons less than in July, while exports were 144,120 tons, 24,217 tons less.

STEEL'S correspondent at Berlin reports further curtailment of iron and steel production is in immediate prospect. The report from Brussels states the markets are uncertain, in a view of the contemplated British tariff. In France no export quotations are being issued in sterling, but in dollars or francs.

German Steel Market Awaits Government Action

Berlin—The German iron and steel industry remains unsettled. No decisions in regard to reduction of prices have been taken and it cannot be expected that producers will take steps to realize that aim before the new government program, which will indicate the winter months' activities, is published.

To what extent this will result in reduction of prices to the final consumer remains to be seen. It is interesting that producers are also considering a plan to reduce basis prices, and to cancel export rebates to exporters of finished products; it is most unlikely, however, that this plan will materialize. The government program is expected to be published about the end of September, and may contain some measures against the price policy of the cartels.

Export markets make a bad showing. Export prices have continued to decline but German steelmasters have not been eager to sell at the current low level, owing to the loss these prices would mean. It is reported that merchant bars are now quoted at as low as £3 2s ($15.08), the Germans being reluctant sellers. However, the more the activity declines, the more will they be inclined to book orders at unprofitable prices. A gratifying feature is improvement in foreign sales of wire nails, owing to better orders from the United States, Great Britain, and Holland, and some export orders for barbed wire have been booked. Exports of plates and sheets are suffering as a result of cheap offers by the Belgians, with which the Germans cannot compete. Belgian offers of iron sheets in Germany are larger.

Belgian Markets Show No Sign of Improvement

Brussels—Depression in the Belgian iron and steel market continues and there are no signs of improvement. The tendency is toward a further decrease of prices and only small purchases are being effected. However, with a continuance of the present situation, either prices will have to be supported or production will have to be curtailed.

Some Belgian works announce that they are working at full capacity and are not losing money at present prices. The latter statement, however, appears questionable, but this opinion is sufficient to indicate that the limit of the decline has not yet been reached, and that it will be difficult to arrive at more remunerative conditions.

The agreement among Belgian, Luxemburg and French producers is reported to have been extended to March 31, 1932, but the Raty works have not accepted to remain in the combine. As a consequence, serious competition in the Belgo-Luxemburg territory is expected. The Belgian price of No. 3 foundry iron ranges from 440 to 450 francs, with basic iron at 410 to 415 francs.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 28 (a)	British gross tons U. K. ports		Continental metric tons Channel or North Sea ports	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)				
PIG IRON				
Foundry, 2.50-3.00 Silicon	$11.29	2 18 6	$9.07 to $9.26	2 7 0 to 2 8 0
Basic bessemer	11.58	3 0 0*	8.69 to 8.88	2 5 0 to 2 6 0
Hematite, Phos. .03-.05	11.58	3 0 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.78	5 2 6	$10.62 to $10.81	2 15 0 to 2 16 0
Wire rods, No. 5 gage	32.81	8 10 0	19.30	5 0 0
FINISHED STEEL				
Standard rails	$31.85	8 5 0	$25.09	6 10 0
Merchant bars	1.20c	7 0 0	.68c to .69c	3 2 0 to 3 3 0
Structural shapes	1.33c	7 15 0	.66c to .67c	3 0 0 to 3 1 0
Plates, †¼-in. or 5mm.	1.42c	8 5 0	.83c to .84c	3 15 0 to 3 16 0
Sheets, black, 24 gage or 0.5mm.	1.51c	8 15 0	1.68c to 1.71c	2 12 6 to 2 15 0
Sheets, gal., 24 gage, corr.	1.59c	9 5 0	1.94c to 1.98c	8 17 6 to 9 0 0
Bands and strips	1.63c	9 10 0	.88c to .91c	4 0 0 to 4 2 6
Plain wire, base	1.46c	8 10 0	1.11c	5 1 3
Galvanized wire, base	1.84c	11 0 0	1.36c	6 3 9
Wire nails, base	1.84c	11 0 0	1.13c	5 2 6
Tin plate, box 108 lbs.	$ 2.61	0 13 6	$2.54	0 13 2‡

British ferromanganese £17 9s 6d ($85.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.80) f.o.b.

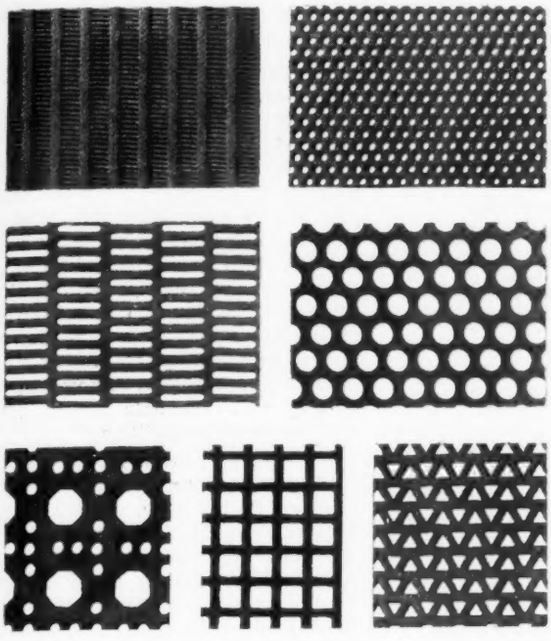
Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Renten Marks
Fdy. pig iron, Si. 2.5	$11.29 2 18 6	$11.06	280(2)	$12.83	460	$18.53 78
Basic bessemer pig iron	11.58 3 0 0*	10.27	260(1)	11.58	415	20.31 85.50
Furnace coke	2.12 0 11 0	5.73	145	5.16	185	5.08 21.40
Billets	19.30 5 0 0	16.59	420	17.44	625	26.25 110.50
Standard rails	1.42c 8 5 0	1.41c	785	1.57c	1,210	1.37c 127
Merchant bars	1.20c 7 0 0	.90c	500	.77c	590	1.38c 128
Structural shapes	1.51c 8 15 0	.99c	550	.76c	585	1.35c 125
Plates, †¼-in. or 5mm.	1.55c 9 0 0	1.26c	700	.92c	705	1.59c 147
Sheets, black, 24 ga. or 0.5mm.	1.51c 8 15 0	2.09c	1,160	1.82c	1,400	1.26c 117
Sheets, galv., corr., 24 ga. or 0.5mm	1.55c 9 0 0	2.39c	1,325	2.47c	1,900	3.56c 330
Plain wire	1.46c 8 10 0	1.68c	935	2.08c	1,600	2.24c 207
Bands and strips	1.63c 9 10 0	1.13c	625	.78c	600	1.60c 148

*Basic. †British ship-plates, Continental bridge plates. ‡German.

British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

(a) This week the lower exchange rate for sterling is used in computing British prices, depressing them abnormally. It is suggested in the cable from London that British producers will advance their quotations to neutralize this artificial decline in their prices.



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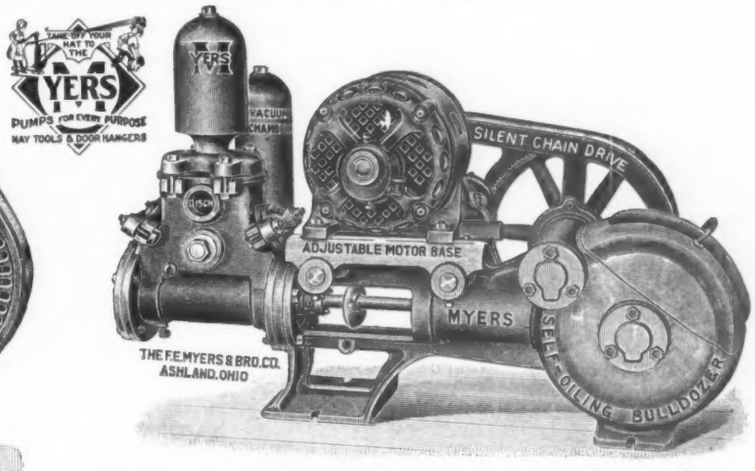

THE F. E. MYERS & BRO. CO.

ASHLAND, OHIO

ASHLAND PUMP AND HAY TOOL WORKS

Machinery

PREDICTIONS of a general upswing in September now must be conceded to have failed of fulfilment. On the other hand, machine tool business during the past month by no means reached the unprecedented low level foreseen by many dealers and builders late in August. Discouraging as the situation may be, there are favorable signs. Certain large users are reported to feel that a slight but definite turn for the better lately has occurred in their business. These users are known to have in mind rather sweeping schedules of re-equipment—lists in some cases actually having already been made up.

New York—With but little more substantial than improved inquiry to account for it, distinctly better feeling is evident here in machine tool circles. Although September business by no means registered the upward trend which was hoped for, neither did it plunge to the depths toward which early indications pointed.

At least one of the largest users of machine tools is reported to believe that the corner has been turned as far as certain metal products are concerned. This well substantiated rumor applies particularly to the electrical industry, which is known to be considering the purchase of large amounts of new equipment. While vitally needed tools on their lists may be released this fall, it is believed that the bulk of this business will be carried over into 1932.

There has been general overhauling of machine tool selling methods in this territory in keeping with the importance of new and improved lines. In most cases, salesmen are reacting to new plans with enthusiasm, particularly when they find their trade to be responsive.

Worcester, Mass.—September, the month of expected revival, unquestionably will prove disappointing when the month's sales are tabulated. Quickening of demand in certain quarters, looked upon as the forerunner of quantity orders, has failed so far to lift the general market out of the single unit sale rut which has been the rule for several months.

Government inquiry is growing but there seems to be no disposition to close hurriedly. The outstanding government inquiries for machines for navy yards at Brooklyn and Newport still are pending, with no indication that they will be booked immediately.

How much activity may be expected from automotive sources within the next several weeks is problematical. Eastern inquiry for machinery for Ford Motor Co., Detroit, has raised hopes that considerable new business is on the horizon.

Pittsburgh—Machine tool orders and inquiry continue at their recent quiet rates, most users displaying a lack of interest in new equipment for replacement or expansion purposes. Sales so far this month are barely holding their own with the unsatisfactory August volume.

Inquiry for special mill equipment is more active, particularly in miscellaneous lines. A fair volume of heavy machinery is in prospect but sellers look for little business from that direction this year.

Cleveland—Scattering orders for machine tools are reported, some being for single units of considerable value. Cleveland Planer Co. has just received such an order from General Electric Co., this covering a 48-inch by 16-foot openside planer for installation at that company's Pittsfield, Mass., plant.

Despite the fact that September turned out to be another discouragingly low month, feelings still persists that sometime this fall—or at least before the first of the year—pending lists of importance will be released.

In the meantime, knowledge that reports for the third quarter are certain to be unsatisfactory, plus disquieting uncertainty as to prospects for the fourth quarter, has caused securities of equipment building companies to drop to new lows in a number of cases. This condition may be counterbalanced, however, by early announcements of new or greatly improved products having promising sales potentialities.

Chicago—Machine tool houses are closing September with a negligible amount of business. Billings were the lightest so far this year, and virtually no carry-over is noted. About a half dozen small inquiries are before the market, chiefly for light production tools. Several concerns are offering to sell used tools to dealers rather than asking for trade-in proposals.

It is expected that Chicago, Burlington & Quincy shortly will start to rebuild part of its Aurora, Ill., shops recently damaged by fire, but will not ask for equipment estimates for two or three months. A proposed can manufacturing plant in Wisconsin may develop an equipment inquiry. Purchase of equipment for the Rumely division of Allis-Chalmers Mfg. Co., LaPorte, Ind., is indefinitely postponed. Several other inquiries are out in Indiana.

Owing to lack of funds, Chicago board of education has stopped construction work on the Lane Technical high school, as well as on the addition to Senn high school, and no immediate inquiries from the board are likely.

Exports of Metalworking Machinery

	August		January through August	
	1931	1930	1931	1930
Engine lathes	45	47	424	906
Turret lathes	15	17	197	332
Other lathes	72	37	501	522
Vertical boring mills and chucking machines	24	22	201	243
Thread-cutting and automatic screw machines	33	48	183	507
Knee and column type milling machines	13	26	122	250
Other milling machines	45	46	362	561
Gear-cutting machines	20	15	309	304
Vertical drilling machines	10	22	227	378
Radial drilling machines	4	6	108	143
Other drilling machines	153	66	1,321	1,212
Planers and shapers	28	14	234	268
Surface grinding machines	19	8	131	157
External cylindrical grinding machines	57	20	281	426
Internal grinding machines	14	13	210	260
Tool grinding, cutter grinding, and universal grinding machines	65	102	605	1,276
Pneumatic portable tools	665	1,405	6,901	13,759
Chucks for machine tools	484	1,149	6,735	18,280

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BRIGHTWOOD, MASS. — Moore Drop Forging Co. is remodeling and enlarging its old hinge shop, converting it into an automotive parts machine shop, with additions of considerable equipment.

FITCHBURG, MASS.—Home Utilities Corp. has established operations for production of vapor oil burners, with headquarters in the M. A. C. building.

BRISTOL, R. I.—Herreshoff Mfg. Co., 13 Burnside street, will build a 2-story plant for the manufacture of yachts. Bids are being received by E. M. Corbett, 49 Purchase street, Fall River, Mass., architect. Approximate cost, $40,000.

New York

BROOKLYN—J. Moss & Sons have been incorporated with $100,000 capital by H. S. Goldstein, 1440 Broadway, New York, to deal in sheet steel products.

NEW YORK—Marquardt Shower Door Corp. has been incorporated with $10,000 capital by L. C. Wills, 26 Court street, Brooklyn, N. Y., to deal in metal articles.

NEW YORK—E. Blaufox has been incorporated with 200 shares common stock to manufacture and deal in machinery, by J. Eisinger, 11 West Forty-second street.

NEW YORK—Modern Wizard Mfg. Corp. has been incorporated with $100,000 capital by L. Braun, 225 Broadway, to manufacture and deal in machinery.

NEW YORK—G & B Brass Mfg. Corp. has been incorporated with $10,000 capital by Kepecs & Frischer, 521 Fourth avenue, to manufacture articles of brass and other metals.

NEW YORK—Robinson Engineering Corp. has been incorporated by J. G. Abramson, 122 East Forty-second street, with $20,000 capital, to manufacture heating and ventilating devices and install same.

WALLKILL—Department of correction, Albany, N. Y., plans construction of a power plant a mechanical laundry and industrial shops at the new state prison at Wallkill.

New Jersey

BAYONNE—Eastern Seaboard Mfg. Co. Inc. has been incorporated with 100 shares common stock to manufacture electrical refrigerators, by Tucker & Tucker, Bayonne.

NEWARK—Curtiss & Smith Mfg. Corp. has been incorporated with 200 shares of common stock to manufacture implements for separating elements from shafts, by McKenna & McKenna, Newark.

NEWARK—Educator Broadcasting Equipment Co. has been incorporated with $50,000 capital to manufacture and install radio broadcasting equipment, by Benny & Cruden, Bayonne, N. J.

RUTHERFORD—Kaufmann & Co. have been incorporated with $100,000 capital to deal in metals, by Ely & Ely, Rutherford.

TRENTON—Kuhn & Jacob, machinists, 501 Prospect street, are having plans made for a new plant on Oakland street, to cost $30,000.

Pennsylvania

BRIDGEPORT — Columbia Gas Construction Co., Charleston, W. Va., has leased a plant at Crooked lane and Church road, including warehouse, repair shop and storage space.

CHESTER—Fire at the export building of the Ford Motor Co. plant caused severe damage which will be repaired at once.

PHILADELPHIA—Code Electric Products Corp. has been incorporated with $100,000 capital by George W. Breyer, 1123 South Forty-seventh street, to manufacture and sell electrical supplies.

PITTSBURGH—Pennsylvania Engineering Corp. has been incorporated with 50 shares no par value to manufacture and deal in iron, steel and other metals and products, by Owen L. Odell, 205 Thorn street, Sewickley, Pa.; Samuel M. Jackson, 329 Roup street, Pittsburgh; Harbaugh Miller, 1152 North Negley avenue, Pittsburgh.

PITTSBURGH—Health-Mor Inc. has been incorporated with $5000 capital to manufacture electric motors, dynamos and appliances, by J. B. McIntire, 513 McNair avenue, Wilkinsburg, Pa.; E. Graubart, 301 Ashland avenue, Pittsburgh; Kenneth R. Cunningham, 6500 Bartlett street, Pittsburgh.

RIDGWAY—Sundell Mfg. Co. has been incorporated with $15,000 capital to manufacture motor car accessories and novelties of metal and wood, by Godfrey E. Sundell, Ridgway.

Ohio

CLEVELAND—Raymond Kitchen Equipment Co. has been incorporated with 100 shares no par value to manufacture equipment for hotels and restaurants, by Burch, Bacon, Sifling, Pheley & Rodgers, Second National Bank building, Akron, O.

CLEVELAND—Heat & Draft Control Inc. has been incorporated with 250 shares no par value to manufacture heat-regulating devices, by W. S. Cohen, 814 Engineers building.

COLUMBUS—City council has ordered preparation of plans for construction of a new municipal sewage treatment plant. Cost is estimated at $4,000,000.

COLUMBUS—Columbus Ornamental Iron Co., 894 Michigan avenue, has been formed by Howard P. Jennings, 1188 Westwood avenue, and associates, to design and manufacture ornamental iron.

COLUMBUS—Hearn Corp. has been incorporated with 250 no par shares to manufacture automatic cigaret rolling machines. James E. McKinnon is president and F. R. Hearn secretary and treasurer. John G. Hearn also is interested.

TOLEDO—Alloy Foundry & Machine Co. has been incorporated with 500 no par shares by W. T. Walker and George R. Effler.

VAN WERT—City, Adolph Rothacker service director, has preliminary plans for construction of a pumping station. Jennings-Lawrence Co., Rowlands building, Columbus, O., is engineer. Bond issue of $500,000 is to be voted on.

YOUNGSTOWN—Expert Iron Works has been incorporated with 50 no par shares by L. H. Isenbert, Mahoning Bank building.

Michigan

BIRMINGHAM—Detroit Edison Co., 2000 Second street, Detroit, has plans for a power plant and office building to be built here. Plans are being completed. Combined cost is estimated at $1,000,000.

DETROIT—E. H. Kotcher Die & Tool Co., 1742 Rivard street, is erecting a small addition at its Sherman street plant.

DETROIT—Bossard Corp., 6000 Grandy avenue, has been incorporated with $100,000 capital by Theodore Bossard, 1850 East Grand boulevard, to manufacture automobile fueling systems.

GRAND RAPIDS—Kohler Aviation Corp. is considering construction of four hangar units at the municipal airport.

MT. CLEMENS—Copeland Products Inc., manufacturer of refrigerating devices, will build an engineering building. Plans are being completed. Cost is estimated at $50,000.

MUSKEGON—Stanfield Piston Rings Inc. has been incorporated with 5000 no par shares by K. Gudelsky, 1284

Ransom street, to conduct a general foundry business.

OWOSSO—H. F. Field, manufacturer of a feed mixer, has arranged for production of an automatic furnace control device invented by E. E. Randall, and will expand facilities.

PETOSKEY—Municipal council is considering construction of a hydroelectric plant on the Bear river near here, at a total cost of about $70,000.

Illinois

CHICAGO—Austin Co., Cleveland, has been given the general contract for a hangar at the Chicago municipal airport for the American Airway Corp.

CHICAGO—Decel Corp., 3945 Sheridan road, has been incorporated with $40,000 capital to operate a steel structural shop, by Julius H. Marling, and Horace S. Gurvey, 33 South Clark street.

CHICAGO—Household Mfg. Co., Cottage Grove avenue and Twenty-second street, has been incorporated with 4000 shares no par value to manufacture kitchen equipment by Frank M. Opeka, 1702 Sherican road, North Chicago, Ill.

MAYWOOD—Plant at Ninth avenue and St. Charles road of the American Can Co., 104 South Michigan avenue, recently was damaged by fire. Loss is estimated at $20,000.

PEORIA—R. J. Jobst Co., 236 Eaton street, has been incorporated with 100 shares no par value to conduct a sheet metal business by John A. Fritch, Margaret Fritch, and H. C. Martens. McGraty & Conley, Jefferson building, Peoria, are correspondents.

Southern States

MONROE, LA.—Mississippi River Fuel Corp. plans construction of a second compressor station near Alto in Richland parish, the main building to be 68 x 100 feet. A pump station will also be erected. Ford, Bacon & Davis Inc., 39 Broadway, New York, are engineers, with C. C. Whitlesey in charge.

SHREVEPORT, LA.—Texas & Pacific railroad, E. F. Mitchell chief engineer, Texas and Pacific building, Dallas, Tex., will build a 10-mile railroad line from Shreveport to Lucas, La., to connect its Louisiana and Texas divisions.

LANGLEY FIELD, VA.—United States War Department, Washington, has allotted $498,000 for 10 hangars at this field.

NASHVILLE, TENN.—City, H. E. Howse mayor, will erect a filtration plant addition, bids to be received Oct. 6. J. N. Chester Engineers, 813 Clark building, Pittsburgh, are engineers.

Missouri

ST. LOUIS—Pittsburgh-Erie Saw Corp. has bought a site in the southern industrial district and will build a new plant and office building at a cost of $100,000. The company manufactures and services butcher saws and other equipment.

ST. LOUIS—Monocoupe Corp., Phil. DeC. Ball, president, is being moved here from Moline, Ill. and will be located in a building formerly occupied by the Ryan-Mahoney Airplane Co. at Lambert- St. Louis field. Expenditure of about $100,000 is involved in equipping the new plant for production of 500 to 600 planes per year.

Texas

GONZALES—Coen Companies Inc., 610 South Broadway, Los Angeles, is reported to plan installation of additional equipment for grinding, conveying and processing, for a daily output of 100 tons of kaolin in its local plant.

MCCAMEY—C. S. Messenger and associates will build an oil refinery in the Pecos valley oil field, for which high pressure pumping machinery will be required. Plant is to have daily capacity of 1500 barrels.

Pacific Coast

SAN FRANCISCO—Pacific Bone, Coal & Fertilizer Co. has let contract to the Austin Co., Cleveland, for a 2-story drying and storage plant, to cost about $60,000.

EVERETT, WASH.—Puget Sound Power & Light Co., Seattle, has plans for improvements including transformers and other equipment to cost $150,000.

Dominion of Canada

POWELL RIVER, B. C.—Westview Light, Power & Waterworks district, H. J. Slade secretary, box 767, will receive bids until Oct. 1 for installation of a complete waterworks system.

ORANGEVILLE, ONT.—Armstrong Foundry & Machine Shop Ltd., whose incorporation recently was noted, is reported to be in the market for equipment to be installed in a proposed plant. Uriah W. Christie is manager. (Noted Sept. 17).

ST. THOMAS, ONT.—Vitrified Products Co. Ltd. has given a contract to the Austin Co., Cleveland, for design and construction of a plant to cost $60,000, covering floor space of 25,000 square feet.

COATICOOK, QUE.—Petro-Montreal Co. has established a plant here and has started the manufacture of Petro-Townsend oil burners for use in ranges and furnaces.

MOUNT ROYAL, QUE.—Town council, W. J. R. McNeil engineer, will ask bids about Nov. 1 for alterations and additions to its power plant and electrical equipment.

VERDUN, QUE.—Town council, Aime Parent secretary, plans to spend $200,000 on sewage plant additions and will be in the market shortly for pumps and other equipment.

New Trade Publications

TRAMRAIL—Showing in a general way the adaptability of its tramrail to the movement of commodities and products Cleveland Electrical Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O., has issued a bulletin of applications in various uses.

FOUNDRY PROGRESS—In Bulletin No. 70 the C. O. Bartlett & Snow Co., Cleveland, has reprinted an address by Arnold Lenz before the Michigan Engineering society on "Foundries Are Keeping in Step." It presents a picture of foundry conditions compared with the recent past, showing the great advances.

BEARINGS—Wyrick Engineering Co., Wyandotte, Mich., in Bulletin No. 102 shows simplified spindle and bearing mounting designs for assuring rigidity and precision in adjustment. The device for automatically maintaining correct bearing adjustment is illustrated and nuts and spacers for manual adjustments are shown. Line drawings guide in selection of the proper devices for various purposes.

CONVEYORS—Mathews Conveyor Co., Ellwood City, Pa., has issued a catalog on steel plant conveyors, including roller, ball and wheel types. It is well illustrated and the text covers applications of the various types to steel mill needs. A feature is a conveyor with fiber-rim wheels for conveying sheet and plate materials which must be protected from scratching or marring.

ECONOMIZER—A bulletin published by the Babcock & Wilcox Co., 85 Liberty street, New York, is devoted to description of its forged steel return bend type economizer, designed to provide a high rate of heat transfer and unusual freedom from expansion strains. All details are fully described and illustrated by photographs and drawings. Installation views and setting plans are also included.

UNIT HEATERS—L. J. Wing Mfg. Co., 154 West Fourteenth street, Newark, has issued a catalog on its featherweight unit heaters, featuring a new model built around its new featherfin heating element. Illustrations show details of the installations and diagrams illustrate distribution of heat under various plans of installation. Tables of engineering data also are presented, including piping and wiring diagrams.